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SAMPLING AND ANALYSIS PLAN
Boeing Realty Corporation's
C-6 Facility – Parcel C
Los Angeles, California

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Prepared for

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Section 1: INTRODUCTION

Parcel C of the Boeing Realty Corporation's C-6 Facility (site), located at 19503 South Normandie Avenue in Los Angeles, California (Figure 1), consists of buildings 1, 2, 3, 19, 20, 32, and 66 (Figure 2). This report presents the Sampling and Analysis Plan (SAP) for the identification of chemicals of concern in and around Buildings 1, 3, 19, 20, and 32. An addendum to this plan covering buildings 2 and 66 will be submitted at a later date. The division of Parcel C is primarily designed to parallel the proposed demolition of the buildings remaining on Parcel C.

1.1 Site Description

Aerial photographs indicate that the C-6 facility was farmland prior to the 1940s. The C-6 facility was first developed by the Defense Plant Corporation (DPC) in 1941 as part of an aluminum reduction plant. The plant was operated by the Aluminum Company of America until late 1944 (CDM, 1991). From 1944 until 1948 the site was used for warehousing by the War Assets Administration (IESI, 1999). In 1948, the property was acquired by the Columbia Steel Company (CSC). In March 1952, the US Navy purchased the property from CSC and established DAC as the contractor and operator of the facility for the manufacturing of aircraft and aircraft parts. DAC purchased the C-6 facility from the Navy in 1970 (CDM, 1991), and continued manufacturing aircraft components until 1992.

Most manufacturing operations at the site have been inactive for approximately 8 years. The manufacturing equipment has been removed from the facility. A limited amount of assembly and activities related to warehousing continued through the mid-2000s. Currently the site is closed and the buildings empty.

1.2 Regional Geology and Hydrogeology

The geology and hydrogeology of the region surrounding the site were determined mainly from reference to reports published by the U.S. Geological Survey (USGS) (Poland and others, 1959) and the California Department of Water Resources (DWR, 1961). Reference also was made to previous reports prepared by Kennedy/Jenks Consultants for the C-6 Facility.

The site is located on a broad plain at an elevation of about 50 feet MSL. The DWR and USGS define this area as the Torrance Plain, a Pleistocene-age marine surface and a subdivision of the Coastal Plain of Los Angeles and Orange Counties. The ground surface in this area is generally flat with an eastward gradient of about 20 feet per mile (less than one-half percent). Surface drainage is generally toward the Dominguez Channel, about a mile to the east. The Dominguez Channel, in turn, flows southeastward toward the Los Angeles and Long Beach Harbors in San Pedro Bay.

The surface sediments in this area are assigned to the Lakewood Formation (DWR, 1961), a unit defined to include essentially all of the upper Pleistocene sediments in the Los Angeles Coastal Plain area. The Lakewood Formation includes deposits of both marine and continental origin, representing stream transport and sedimentation along the Pleistocene marine plain. In the Facility area, the Lakewood Formation may include the Semi-perched Aquifer, the Bellflower Aquiclude, and the Gage Aquifer. The Semi-perched Aquifer includes deposits described as Terrace Cover (Poland and others, 1959). Extent and thickness of this unit is not rigorously defined, but appears to include the near-surface water-bearing units in the area of the Facility. The Bellflower Aquiclude

is described as a heterogeneous mixture of continental, marine, and wind-blown sediments, mainly consisting of clays with sandy and gravelly lenses (DWR, 1961). The base of the Bellflower Aquiclude is about 100 feet below sea level (about 150 feet bgs) in the site area. The Gage Aquifer is a water-bearing zone of fine to medium sand and gravel confined by the Bellflower Aquiclude. It is reported to be about 40 feet thick in the site area and is described as being of secondary importance as a water source (DWR, 1961).

The Lakewood Formation is underlain by the Lower Pleistocene San Pedro Formation, which continues to about 1,000 feet in depth in the Facility area. Major water-bearing zones within the San Pedro Formation are the Lynwood Aquifer and the Silverado Aquifer. These are reported to be at depths of about 300 and 500 feet, respectively, in the Facility area (DWR, 1961). The Silverado is an important groundwater source in the Coastal Plain and is considered a source of drinking water (DWR, 1961).

1.3 Local Geology and Hydrogeology

1.3.1 Local Geology

The drilling program conducted during the Phase II Soil Characterization of Parcels A and B provided extensive information with regard to the sediments within the upper 50 feet at the site. The drilling program included 40 hollow-stem auger borings and 220 direct-push probes, totaling over 5,500 linear feet.

Several distinctive soil units were recognized in the subsurface and can be correlated between borings, as shown on Figures 3 through 5. For convenience in this text, the subsurface soil units are informally designated Units Q1 through Q4.

Unit Q1: Unit Q1 is a layer of silty clay and sandy clay encountered at the surface or just below the pavement or engineered fill soils over the entire Facility. This clay is typically dark brown to dark reddish brown in color and medium stiff to hard. It has moderate to high plasticity and is classified as CL or CH under the Unified Soil Classification System (USCS). Unit Q1 has a uniform thickness of about 5 feet along the west side of the Facility. It thickens to about 22 feet on the northeast corner of the Facility.

Unit Q2: Unit Q2 comprises a sequence of interbedded clayey silt, fine sandy silt, and fine silty sand with minor lenses of silty clay. The predominant USCS classifications are ML and SM. The Unit Q2 soils are brown, olive brown, and reddish brown in color and are generally medium dense. Unit Q2 is about 17 to 20 feet thick and the base is about 22 to 25 feet bgs along the west side of the Facility. The unit thickens to about 30 feet at the east side of the Facility. The base of Unit Q2 also slopes eastward, and occurs at depths of 45 to 50 feet along the east side of the Facility.

Unit Q3: Unit Q3 is an interval of fine and very fine sand with only minor silt. Soils in this interval generally are classified as SP and SP-SM under the USCS. This soil unit includes distinctive beds containing abundant shell fragments. The sand is mainly light yellowish brown to light yellowish gray in color. It has generally massive structure, and commonly is described as being similar to beach sand. The sand is generally dense, but has essentially no cohesion.

Unit Q3 is more than 28 feet thick on the west side of the Facility, extending from about 22 feet bgs to below the 50-foot depth drilled at the northwest corner of the Facility. However, in the southern part of the Facility, Unit Q3 is interlayered with Unit Q4, a wedge of fine silty sand and fine sandy silt.

Unit Q4: Unit Q4 was observed in borings in the southwestern and central part of the Facility. It pinches out in the northwestern part of the area and is likely below the depth drilled on the east. Maximum thickness of this soil unit is about 17 feet, on the southwest. Unit Q4 mainly contains fine silty sand (SM) and clayey silt (ML) with thin interbeds of silty clay and fine sand. These soils are generally yellowish brown in color and are medium dense to dense.

1.3.2 Local Hydrogeology

Groundwater conditions at the Facility are known from previous investigations and from the quarterly groundwater monitoring program (Kennedy/Jenks Consultants, 1997a). Groundwater samples from 15 observation wells at the Facility have been sampled and analyzed on a quarterly basis since 1992. The drilling for the Phase II Soil Characterization was entirely in the unsaturated zone and did not provide additional information on groundwater.

The uppermost groundwater at the Facility appears to be under water-table conditions at depths of 60 to 70 feet. Regionally, this uppermost groundwater is probably considered part of the Semi-perched Aquifer discussed previously and is separated from the deeper zones by the Bellflower Aquiclude.

Monitoring wells at the Facility are completed in two zones. Most of the wells are completed at or near the water table, at depths of about 55 to 90 feet. Two deeper wells, WCC-1D and WCC-3D, are completed in a deeper zone at about 115 to 140 feet. Well WCC-1D has since been abandoned.

Complete records of water-level measurements are included in the quarterly Groundwater Monitoring Summary Reports (Kennedy/Jenks Consultants, 2000). The hydraulic gradient in the uppermost groundwater is generally toward the south. The July 1999 average groundwater gradient was 0.0007 ft/ft.

Section 2: Drilling and Sampling Methods

Field activities will be initiated with selection of sampling locations, notification and clearance by Underground Services Alert (USA), geophysical screening for unknown underground obstructions, and coring of concrete paving to access subsurface soils.

Sampling will be accomplished using direct-push and hollow-stem auger drilling methods. The direct push technology uses a truck-mounted or portable hydraulically driven sampler or core barrel that allows penetration and standard sampling without the generation of drill cuttings. Hydraulic push drilling equipment is a rugged, lightweight, hydraulic drive point system designed to perform sampling and monitoring services specific to the environmental industry. The carrier vehicle is typically a four-wheel drive, one-ton pickup truck with a reliable power take-off hydraulic system

The direct push hydraulic unit consists of a rear-mounted, dual ram configuration mounted in conjunction with a vibrating component that is capable of producing high-frequency impact energy. A 5,000-pound static reaction weight and 15,000-pound pullback capacity provide ample force to overcome most common geologic conditions. The low profile mast is twelve feet high when fully extended and the framework of the machine is boom articulated to allow for a full range of positioning, including up to a 20 degree angle for boring underneath structures.

Soil samples will be obtained by using either of two primary methods, a 2.0-inch O.D. (outside diameter) x 36-inch overall length coring tube or 2.0-inch O.D. x 24-inch (nominal) overall length discrete piston sampler.

The samplers are threaded onto the leading edge of a 1.5-inch O.D. probe rod and advanced to depth using the direct push system. The probe rods are nominally 4-feet in length and additional rods are connected to reach the desired depth. Soil samples are retrieved by retracting the probe rod and sampler to the surface and disassembling the sampler.

Samples are obtained in industry standard 1-inch to 1.25-inch sleeves made of brass, stainless steel, or acetate. The sleeves are removed from the sampler; Teflon squares are placed over each end and capped for transport to a laboratory for analysis.

The continuous coring system drives a 2" O.D. casing and a 24" split barrel sampler. The casing remains in place while the sampler is withdrawn preventing any sloughing or cross contamination. The 24" split barrel is then lowered into the casing and the system is advanced another 2', repeating the process until the desired depth is reached. Samples are withdrawn from the split barrel in 1" x 24" acetate liner, or stainless steel and brass liners may be used.

A mobile B-53 or equivalent hollow-stem auger rig will be used to drill and sample the proposed, deeper boreholes (greater than 25 feet, if necessary). Sampling will be conducted using a standard split sampler fitted with 2-inch diameter, 6-inch long brass sleeves. Cuttings from these borings will be drummed and the holes backfilled to grade with a cement-bentonite grout.

Soil types encountered will be logged using the Unified Soil Classification System (USCS) at each boring. Drummed cuttings will be labeled, inventoried, and stored at the C-6 facility for later disposal by BRC.

2.1 Sample Handling

Soil samples will be identified with a boring number and depth using a predetermined nomenclature. For the Parcel C characterization, an example identification code is:

C-3-1-10
Where
C- parcel C
3- building number.
1- boring no. in that building
10 depth where sampling began

Samples will be placed in ice-cooled insulated containers upon collection and transported to an offsite laboratory by courier at the end of each day. Sample custody will be maintained by the field sampler or field supervisor until transfer to the laboratory. Sample custody will be documented on standard chain-of-custody forms.

2.2 Sample Analytical Program

Analytical methods were selected for potential chemicals of concern based on the Phase 1 Environmental Site Assessment (PESA) findings and review of many old maps, plans, and drawings from Boeing archives. Analytical methods selected and the number of samples analyzed for each boring are detailed in Table 1 and summarized below.

- Samples collected at locations with potential volatile organic compound (VOC) releases will be analyzed by EPA Method 8260. This method will include methyl tertiary butyl ether (MtBE), tertiary butanol (tBA), di-isopropyl ether (DIPE), tertiary amyl methyl ether (TAME), and ethyl tertiary butyl ether (EtBE).
- Samples collected at locations with potential semi-volatile organic compound releases will be analyzed by EPA Method 8270.
- Samples collected at a location with potential fuel releases will be analyzed by modified EPA Method 8015 for Total Carbon Chain.
- Samples collected at locations with potential heavy metals releases will be analyzed by EPA Method 6010 for CAM metals and by EPA Method 7196 for Chrome VI.
- Samples collected at locations with potential polychlorinated biphenyl (PCB) releases will be analyzed by EPA Method 8082 for PCBs.
- Samples collected at locations with potential pesticide releases will be analyzed by EPA Method 8080.
- Samples collected at locations with potential acidic or basic conditions will be analyzed for pH by EPA Method 9045.

Section 3: Soil Sampling Plan

Three main factors have been considered in the selection of sampling locations: 1) past history of the site including specific processes and specific building/area uses, 2) historical soil and groundwater data, and 3) inspection of the concrete slabs for indications of locations of specific reported processes. Based on these data, areas of concern have been identified within and immediately surrounding the buildings in Parcel C. Examples of areas of concern are basically locations where past processes that are known or suspected to have used hazardous chemicals, locations where hazardous chemicals were stored and associated transportation lines, drains, etc. Chemicals of concern are the specific hazardous materials used or suspected of being used in specific areas of concern. These chemicals are determined by known, documented, specific use or storage, understanding of similar processes at other locations and a basic understanding of facility equipment uses and locations.

In addition to sampling at specific areas and features of concern, and based on the results of the proposed sampling and analyses for the SAP, step-out sampling may be performed during implementation of the SAP. Step-out sampling locations will be based on the Health Based Remediation Goals previously established for the C-6 facility (Table 1).

The essence of the SAP is presented in Tables 2 through 5 and Figures 3 through 5. Tables 2 through 5 present building specific areas and features of concern by number, cross-referenced to a specific figure, summarized information on the area or feature of concern, the chemicals of concern, proposed number of soil borings, depths to be sampled and the analytical tests to be performed on the soil samples. The areas of concern and proposed soil boring location figures show the areas of concern by building and feature number, the location of the proposed soil boring, and the location of previous soil borings, and are cross-referenced to the applicable tables.

The areas of concern are shown on Figures 3-5. An example of a specific process and specific area of concern is the chrome recovery system located on the east side of Building 1.

The overall sampling plan is summarized on Table 1 (Building 1), Table 2 (Building 3), Table 3 (Building 20), and Table 4 (Building 32), and on Figure 3 (Building 1), Figure 4 (Buildings 3 and 19), and Figure 5 (Building 20 and 32).

3.1 Building 1 (Table 2 and Figure 3)

3.1.1 Historical Uses

Building 1 is an approximately 250,000 square foot building that was used as a parts and records storage warehouse. The building was originally used as a carbon baking area when the facility was an aluminum production plant. More recent activities have included metal finishing processes such as heat treating, milling, and pressing. All equipment has been removed.

Historical drawings from the 1940s up to 1984 and aerial photographs indicate that Building 1 was originally three individual buildings with two enclosed patio areas between the three buildings. The drawings show that one patio area was an emissions scrubber and water treatment area. According to a 1952 demolition drawing, other structures removed from the patio areas included a smoke stack, a pump house, and six underground fuel storage tanks.

A one-level basement underlies portions of the structure. The basement was not part of the original construction of the three buildings; it may have been added in the 1952 renovation of the building. The basement was used for the storage of dies, molds, and records. DAC personnel stated that the east wing of the basement was once used as a painting area. There are three freight elevators and three stairways providing access to the basement. Most of the areas of concern in the basement were previously sampled. There are three areas of concern in the basement remaining and because they are close to basement walls, the borings have been moved to outside the building or on to the slab of the first floor of Building 1 to eliminate the need to get a drilling rig into the basement.

There were dip tanks located in the western annex of the building.

Floor patches on the first level and in the southwest corner of the Building 1 indicate the former location of several drop hammer pits. According to DAC personnel, these pits were approximately 10 feet deep. The pits have been filled with concrete with the exception of one pit that is covered with steel plates.

A mezzanine level in an annex at the north end of the building housed several transformers that were labeled as containing polychlorinated biphenyls (PCBs). This area is outside the boundaries of the Subject Property.

3.1.2 Chemicals of Concern

- VOCs
- SVOCs
- Hydrocarbons
- Metals
- pH
- PCBs

3.1.3 Sampling Rationale

Investigate the areas of concern throughout and immediately outside of Building 1 for specific environmental concerns related to oil storage (1), coolant reclamation (2, 3, 6), chrome removal (4, 5), fuel tanks (7, 7A), various ASTs (8, A1, A2, A3, A6, A23, A24), sewer manhole (C1), drains (D1, D2, D6, D7, D8, D17), bermed areas (F1, F5), machine foundations (F2, F3, F4), anodizing process system (F6, S3, S23, S43), titanium processing system (F7), fuel oil pump house (F8), hydraulic press (F24), router with conveyor (F25), paint storage and spray booths (42, P19, P20, S2), variac mill (S1), tar settling basin (S5), aluminum cleaning system (S10A, S60), support cavities (S11, S12), vault (S41), Clarigier (S42), punch press pits (S49 through S59), pits in heat treating furnace area (S61, S62, S63), power substation (T2), USTs (U1 through U5, U17 through U25, $\mu\text{G/l}$ 27, U28), lead burner (9), and machine shop (43). Sixty-six borings will be placed in specific areas of concern. A summary of the sampling follows (refer to the maps and tables for specific locations):

Depth: 1',5' – (router with conveyor, pit, and power substation)

1',5',10' – (coolant reclamation system, chrome removal area, ASTs, metal processing, paint stripping and mixing, machine shop, chemical mills, drains, bermed areas, machine foundations, anodizing process system, punch press pits, and fuel oil pump house)

1',5',10',15',20' – (ultra filter for waste coolant, degreasers, heat treating pits)

5',10' – (specific drains and support cavities)

5', 10', 15' – (machine pits, aluminum anodizing system, titanium processing system)

5', 10',15',20' – (aluminum cleaning system)

10', 15', 20' – (USTs)

20',25',30' – (tar settling basin)

Spacing: Specific areas of concern:

Analyses: VOCs at the: chrome recovery, removal system, lead burner, degreasers, caustic storage areas, chemical mills, process above ground tanks, drains, anodizing and titanium processing areas, machine shop, tar settling basin, aluminum anodizing and cleaning systems, underground storage tanks, and specific storage areas.

SVOCs: at the lead burner, above ground degreasers, aluminum chemical mill containment, titanium processing system, fuel oil pump house, tar settling basin, heat-treating furnace area, and specific underground storage tanks.

Metals: at the coolant reclamation system, chrome recovery and removal systems, lead burner, specific degreasers, chemical mills, specific above ground storage tanks, drains, aluminum chemical mills, titanium processing system, fuel oil pump house, heat treating areas, machine shop, clarifiers, tar settling basin, metal processing areas, aluminum cleaning system, specific pits and specific underground storage tanks.

Chrome VI: at the chrome removal and recovery process areas, aluminum chemical mill containment area, and the heat-treating furnace pit.

TPH: at the coolant recovery system area, specific above ground storage tanks, specific below ground storage tanks, lead burner area, degreasers, chemical mill, specific drains, machine foundations, fuel oil pump house, machine shop, clarifiers, tar settling basin, punch press pits, power substation, and the paint stripping system.

PCBs: at the above ground storage tanks located near transformers, and the power substation.

pH: at the above ground degreaser tanks, deionized water processing system, specific drains, aluminum chemical mills, anodizing process area, titanium processing area, and caustic storage tank area.

3.2 Building 3 (Table 3 and Figure 4)

3.2.1 Historical Uses

Building 3 is an approximately 168,000 square foot, three-story brick office building that housed DAC administrative offices when the facility was in operation. Most of the offices are currently vacant. Review of historical documents indicates the presence of a small paint laboratory, a chemical laboratory, a small underground storage tank, and two electrical transformers located inside Building 3.

The structure was originally a rectifier building when the facility was an aluminum production plant. Aerial photographs from the 1940s show a large number of electrical transformers on the west side of the building. DAC facility drawings show that the building was renovated into its present layout in 1952. Based on newly available historical drawings dating back to 1942 that showed the location of concrete piers along the west side of Building 3, an extensive investigation was completed as a supplement to the Parcel B Site Investigation in 1998. The Supplemental Investigation conducted soil sampling along the western side of Building 3 to 2.5 feet below ground surface (bgs) and analyzed for PCBs (IESI, 1998). The locations of these previous soil samples are shown on Figure 4.

3.2.2 Chemicals of Concern

- VOCs
- SVOCs
- Hydrocarbons
- Metals
- PCBs

3.2.3 Sampling Rationale (Table 1 and Figure 3)

Investigate a small paint laboratory (P1), chemical laboratory (18), and a reported 80 gallon underground storage tank (U16) located in the southern half of Building 3, and two inside transformers (T14 and T15) in the northern half of Building 3. Four soil borings will be placed in the specific area and sampled as follows:

Depth: 1',5',10' – (in the paint and chemical laboratories)

1',5 – (below the transformer area)

10',15',20' – (below the UST)

Spacing: Specific areas of concern

Analyses: VOCs, SVOCs and metals: at the paint and chemical laboratories

pH: at the chemical laboratory

VOCs and TPH: beneath the UST location, including MtBE

PCBs: at the transformers

3.3 Building 19 (Figure 4)

3.3.1 Historical Uses

Building 19 is an approximately 7,500 square foot brick building that housed the security office and emergency services for the facility. The building also served this function during manufacturing operations.

3.3.2 Chemicals of Concern

None.

3.3.3 Sampling Rationale

There are no areas of concern and no sampling proposed in Building 19.

3.4 Building 20 (Table 4 and Figure 5)

3.4.1 Historical Uses

Building 20 was the vehicle maintenance area of the facility and contains the following: battery recharging area in the north end of the building, a 3-stage clarifier draining a steam cleaning booth, an above ground motor oil tank, hydraulic lifts and a condensation pit in the southwest corner. Outside the building was an active pump island that dispensed unleaded and regular gas from underground storage tanks.

3.4.2 Chemicals of Concern

- VOCs
- Hydrocarbons
- Metals
- pH

3.4.3 Sampling Rationale

Investigate the areas throughout building 20 and outside for specific areas of concern associated with the battery storage areas (13 & 14), coolant use area (15), general automobile and truck maintenance (55), fuel AST (A4), motor oil AST (A5), drains (D4 & D5), clarifier (S8), shallow pit (S9), condensation pit (S10), and the hydraulic lift (U14). Some of these areas have been sampled during a previous site investigation. Six soil borings will be placed in the specific areas of concern and sampled as follows:

Depth: 1',5' – (below the concrete in the battery storage areas and the general maintenance area)

1',5'; 10' – (below the fuel AST)

5',10', 15' – (below the hydraulic lift)

Spacing: Specific areas of concern

Analyses: VOCs: in the general maintenance area and the shallow pit.

Metals: in the battery storage areas and the general maintenance area

TPH: at all locations including MtBE, etc.

pH: at the battery storage areas

3.5 Building 32 (Table 5 and Figure 5)

3.5.1 Historical Uses

Building 32 was built sometime in the 1980s and has always been the cafeteria and meeting hall. A small salvage yard was located outside the building to the north. Recently identified areas containing a transfer area, painting and paint storage, drains, oil storage and underground storage tanks are present immediately north, west, and southwest of Building 32.

3.5.2 Chemicals of Concern

- VOCs
- Hydrocarbons
- Metals

3.5.3 Sampling Rationale

Investigate the recently identified specific areas of concern north, west and southwest of Building 32, including the waste transfer area (10), paint area (11), paint storage area (12), drain (D3), covered pit (S6), clarifier (S7), USTs (U6 & U7), and step-out borings (X1 & X2). Ten soil borings are proposed in the specific area and sampled as follows:

Depth: 1', 5' – (step-out borings from 2BB-5-20)

1', 5', 10' – (waste transfer area and drain)

5', 10' – (covered pit)

5', 10', 15', 20' – (paint and paint storage areas)

10', 15', 20' – (clarifier, and USTs)

Spacing: Specific area of concern

Analyses: VOCs: at all locations except step-out borings

Metals: at all locations

Hydrocarbons: at all areas except for the paint and paint storage area

Section 4: QUALITY ASSURANCE/QUALITY CONTROL

4.1 Method References

Analytical services will be provided by Orange Coast Analytical (OCA). The analytical methods used at OCA are based on procedures in the following references:

- U.S. EPA Document SW-846, Test Methods for Evaluating Solid Waste, Third Edition, Revision 1,2,3
- U.S. EPA Document 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, March 1983
- Standard Methods for the Examination of Water and Waste Water, 18th Edition, 1992
- California State Water Resources Control Board, Division of Water Quality, Leaking Underground Fuel Tank Field Manual, October 18, 1989.

This section of the document provides a summary of the analytical methods employed by OCA. QC criteria are summarized in Table 5. This section is not meant to be a step-by-step guide nor a complete description of the analytical procedures. Reference is made to detailed descriptions in SW-846 and other relevant documents.

4.2 pH by EPA Method 9045

Introduction: The purpose of this procedure is to describe the method for measuring the hydrogen ion (H⁺) concentration in waters, wastes, and soils.

Calibration: Calibration is accomplished by measuring the pH of two standard reference buffer solutions that bracket the expected pH of the samples. The reference buffer solutions must be at least three pH units apart.

4.2.1 Sample Preparation

Aqueous Samples: Water samples are brought to ambient temperature and then measured directly.

Waste/soil Samples: Soil samples are prepared by a liquid-solid extraction. 10 grams of soil are weighed to the nearest 0.1 gram and placed into a clean VOA vial with 10mL of reagent water. The sample is then shaken, allowed to settle, and measured directly.

4.2.2 Standard Preparation

pH Reference Solutions: Solutions are bought commercially and the pH values range from 4-10.

4.2.3 Instrumentation

Beckman pH Meter

4.3 Carbon Chain Identification (CCID) by EPA Method 8015 Modified for Fuels

Introduction: The purpose of this procedure is to describe the GC method for quantification of the carbon chain ranges in soils, solid wastes, and waters using a gas chromatograph that utilizes a flame ionization detector (FID). The carbon chain ranges are defined as follows: up to and including C-12, C-13 to C-22, and C-23 and higher.

Calibration: Calibration is accomplished by using external standard techniques. Calibration standards are composed of the anticipated fuel product to be analyzed. Standards are prepared and analyzed at five concentrations spanning the linear range of the instrument. The calculated average response factor is then evaluated for linearity. Linearity is acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%.

4.3.1 Sample Extraction and Preparation

Aqueous Samples: Water samples are prepared by liquid-liquid extraction. A one-liter sample volume is extracted in a 2L separatory funnel with 25mL of methylene chloride by shaking vigorously for 2 minutes. The layers are allowed to separate. The solvent layer is then passed through sodium sulfate, concentrated to 1mL, and injected into the gas chromatograph.

Waste/Soil Samples: Soil samples are prepared by liquid-solid extraction. 25 grams of soil are weighed to the nearest 0.1 gram and placed into a clean 4oz jar with enough methylene chloride to cover the waste. Sodium sulfate may be added as necessary. After the sample is allowed to soak for 30 minutes, the slurry is passed through sodium sulfate, concentrated to 1mL, and injected into the gas chromatograph.

4.3.2 Standard Preparation

NEAT Standard: Pure fuel product.

Stock Standard (Dichloromethane): 10% w/v, (100,000mg/mL).

Calibration standards (Dichloromethane): Calibration standards are serially diluted in dichloromethane from the stock standard to obtain five calibration standards ranging from 200mg/mL to 5000mg/mL.

4.3.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked at 5mg/L (ppm) from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked at 100mg/kg (ppm) from the stock standard in duplicate.

4.3.4 Instrumentation

Gas Chromatography

Instrument:	HP 6890 Series GC with autosampler
Column:	30m X 0.32mm X 0.25mm, HP-5
Carrier flow:	Helium at 3.0mL/min.

Detector temperature: 300°C
Injector temperatures: 275°C
Column oven: 50°C for 4 minutes, 50 to 280°C at 20°C/minute, hold at 280°C for 10.5 minutes

4.4 Metals By EPA Methods 6010

Introduction: The purpose of this procedure is to describe the determination of metals in soils, solid wastes, and waters by inductively coupled plasma atomic emission spectroscopy (IES-AES). Details of the method are found in EPA SW-846. This method, approved by EPA, is a quantitative method for the determination of metals in solution.

Calibration: Calibration is accomplished by internal standard techniques. Each working range is determined using five points of different concentrations and verified for linearity for each element semi-annually. Linearity is acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%. Daily standards, check standards, and linear range standards are employed to verify this daily.

4.4.1 Sample Digestion and Preparation

Aqueous Samples: For water samples, a 50mL aliquot is digested using mineral acids on a hot block at 95°C. The volume is reduced during the digestion process and then finally restored to 50mL with analyte free reagent water.

Waste/soil Samples: Soil samples are digested using mineral acids and peroxide on a hot block at 95°C. 2 grams of soil are weighed out to the nearest 0.1 gram, placed into a digestion cup, and acids are added. Following the digestion process, the slurry is filtered, rinsed, and brought to a volume of 50mL with analyte free reagent water.

4.4.2 Standard Preparation

Stock Standards (0.1-5% HNO₃): 1000µg/mL each.

Calibration standards (0.1% HNO₃): Calibration standards are prepared from the stock standards and serially diluted in 0.1% HNO₃ to obtain five calibration standards ranging from 10µg/L to 500µg/mL.

4.4.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked at 1µg/mL (ppm) from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked at 1-5mg/kg (ppm) from the stock standard in duplicate.

4.4.4 Instrumentation

Perkin-Elmer Optima 3000XL Spectrometer

4.5 Hexavalent Chromium by EPA Method 7196

Introduction: The purpose of this procedure is to describe the colorimetric determination of dissolved hexavalent chromium [Cr(VI)] in water and soil extracts using an UV/VIS spectrometer.

Details of the method are found in EPA SW-846. This method, approved by EPA, is a quantitative method for the determination of Cr(VI) in solution. The stability of Cr(VI) is unknown and analysis must be done as soon as possible.

Calibration: Calibration is accomplished by external standard techniques. Standards are prepared by serial dilution and analyzed at five concentrations spanning the linear range of the instrument. The calculated average response factor is then evaluated for linearity. Linearity is acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%.

4.5.1 Sample Extraction and Preparation

Aqueous Samples: For water samples, a 100mL aliquot is extracted/acidified with an H₃PO₄/NaF solution and divided into two portions. Each portion is then diluted to 100mL. To one portion analyte free reagent water is added and to the second portion the colorimetric dicarbazine solution is added. The absorbance of each solution is measured at 540nm. The absorbance of the sample blank is subtracted from the absorbance of the sample with the coloring agent.

Waste/soil Samples: Soil samples are prepared by liquid-solid extraction. 10 grams of soil are weighed out to the nearest 0.1 gram, placed into a beaker, and extracted with a H₃PO₄/NaF solution. The slurry is allowed to settle and then filtered. The extract is then diluted to 100mL then treated as an aqueous sample.

4.5.2 Standard Preparation

Stock Standard (Reagent Water): 500µg/mL.

Calibration standards (Reagent Water):

Calibration standards are prepared from the stock standard and serially diluted in analyte free reagent water to obtain five calibration standards ranging from 10µg/L to 750µg/L.

4.5.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked at 100µg/L (ppb) from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked at 5mg/kg (ppm) from the stock standard in duplicate.

4.5.4 Instrumentation

Hach DREL/5 UV/VIS Spectrophotometer

4.6 Polychlorinated Biphenyls (PCBs) by EPA Method 8082

Introduction: The purpose of the procedure is to describe the method for the determination of PCBs in soils, solid wastes, and waters using a gas chromatograph that utilizes an electron capture detector (ECD). Details of the method are found in the EPA SW-846. This method, approved by EPA, is a quantitative method for the determination of PCBs.

Calibration: Calibration is accomplished by using external standard techniques. Standards are prepared and analyzed individually at five concentrations spanning the linear range of the instrument. The calculated average response factor is then evaluated for linearity. Linearity is

acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%.

4.6.1 Sample Extraction and Preparation

Aqueous Samples: Water samples are prepared by liquid-liquid extraction. A one-liter sample volume is extracted in a 2L separatory funnel with 40mL of methylene chloride by shaking vigorously for 2 minutes. The layers are allowed to separate. The solvent layer is then passed through sodium sulfate. This step is repeated twice more with shaking times reduced to one minute. The extract is concentrated to 2-3mL and exchanged into 4-5mL of hexane. This hexane extract is then concentrated to 2mL and injected into the gas chromatograph.

Waste/soil Samples: Soil samples are prepared by liquid-solid extraction. 25 grams of soil are weighed to the nearest 0.1 gram and placed into a clean 4oz jar with enough 1:1 acetone/hexane to cover the waste. Sodium sulfate may be added as necessary. After the sample is allowed to soak for 30 minutes, the slurry is passed through sodium sulfate, concentrated to 2mL, and injected into the gas chromatograph.

4.6.2 Standard Preparation

Stock Standards (Hexane): 2000mg/mL.

Calibration standards (Hexane):

Calibration standards are prepared from the stock standards and serially diluted in hexane to obtain five calibration standards ranging from 200µg/L to 1000µg/L.

4.6.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked at 20µg/L (ppb) with PCB-1260 from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked at 250µg/kg (ppb) with PCB-1260 from the stock standard in duplicate.

4.6.4 Instrumentation

Gas Chromatography

Instrument:	HP 6890 Series GC with autosampler
Column:	30m X 0.32mm X 0.25µm, DB-17
Carrier flow:	Nitrogen at 3.0mL/min.
Detector temperature:	275°C
Injector temperatures:	250°C
Column oven:	80°C for 1 minute, 80 to 190°C at 30°C/minute, 190 to 280 at 6°C/minute and hold for 3.0 minutes

4.7 Volatile Organic Compounds by EPA Method 8260

Introduction: The purpose of this procedure is determination of volatile organic compounds in soils, solid wastes, and waters using a gas chromatograph coupled to a mass selective detector.

Details of the method are found in the EPA SW-846. This method, approved by EPA, is a quantitative method for the determination of volatile organic compounds.

Calibration: Calibration is accomplished by using internal standard techniques. Standards and surrogates are prepared and analyzed at five concentrations spanning the linear range of the instrument. The calculated average response factor is then evaluated for linearity. Linearity is acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%.

4.7.1 Sample Extraction and Preparation

Aqueous Samples: For water samples, a 5mL aliquot is drawn into a 5mL syringe fitted with a Luer-Lok tip. It is then spiked with an internal/surrogate mixture and loaded into the purge-and-trap. If small aliquots of sample are necessary, the aliquot is injected into the 5mL syringe containing the volume of volatile free reagent water required to make up the 5mL.

Waste/soil Samples: Soil samples are either extracted with methanol or directly sparged by creating a slurry with water. The methanolic extraction is achieved by placing 10grams of the soil sample into a 40mL VOA vial with 10mL of reagent purge-and-trap grade methanol. The VOA is then hand shaken for two minutes. Depending on anticipated concentration, 2 to 100µL of the extract is added to 5mL of volatile free reagent water along with internal/surrogate and loaded into the purge-and-trap.

4.7.2 Standard Preparation

Stock Standards (Methanol): 2000mg/mL.

Calibration standards (Methanol):

Calibration standards are prepared from the stock standards and serially diluted in methanol to obtain five calibration standards ranging from 0.5µg/L to 200µg/L.

4.7.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked at 20µg/L (ppb) from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked at 50µg/kg (ppb) from the stock standard in duplicate.

4.7.4 Instrumentation

Purge-and-Trap Conditions

Instrument:	OI Analytical DPM-16 / 4460
Trap:	Tenex/silica gel/cms
Purge flow:	40 mL/min
Purge time:	11 minutes
Desorb time:	4 minutes
Desorb temperature:	180°C
Bake time:	14 minutes
Bake temperature:	180°C

Gas Chromatography

Instrument:	HP 5890 Series GC
Column:	30m X 0.32mm X 0.25µm, HP-5MS
Carrier flow:	Helium at 1.0mL/min.
Detector:	Mass Selective Detector (FID).
Detector temperature:	280°C
Injector temperatures:	220°C
Column oven program:	50°C for 0.5 minutes, 50 to 120°C at 6°C/minute, 120 to 210°C at 20°C/minute

4.8 Semi-Volatile Organic Compounds by EPA Method 8270

Introduction: The purpose of the procedure is to describe the method for the determination of semi-volatile organic compounds in soils, solid wastes, and waters using a gas chromatograph coupled to a mass selective detector. Details of the method are found in the EPA SW-846. This method, approved by EPA, is a quantitative method for the determination of volatile organic compounds.

Calibration: Calibration is accomplished by using internal standard techniques. Standards and surrogates are prepared and analyzed at five concentrations spanning the linear range of the instrument. The calculated average response factor is then evaluated for linearity. Linearity is acceptable when the percent relative standard deviation (%RSD) of the average response factor is less than 15%.

4.8.1 Sample Extraction and Preparation

Aqueous Samples: Water samples are prepared by liquid-liquid extraction. A one-liter sample volume brought to a pH of 5-9 and extracted in a 2L separatory funnel with 25mL of methylene chloride by shaking vigorously for 2 minutes. The layers are allowed to separate. The solvent layer is then passed through sodium sulfate. This is repeated once more. The sample is then acidified to a pH of 2 and extracted twice as described above. The resulting combined extract is concentrated to 1mL, and injected into the gas chromatograph.

Waste/soil Samples: Soil samples are prepared by liquid-solid extraction. 20 grams of soil are weighed to the nearest 0.1 gram and placed into a clean 4oz jar with enough methylene chloride to cover the waste. Sodium sulfate may be added as necessary. After the sample is allowed to soak for 30 minutes, the slurry is passed through sodium sulfate, concentrated to 1mL, and injected into the gas chromatograph.

4.8.2 Standard Preparation

Stock Standards (Dichloromethane): 2000mg/mL.

Calibration standards (Dichloromethane):

Calibration standards are prepared from the stock standards and serially diluted in dichloromethane to obtain five calibration standards ranging from 0.5µg/L to 150µg/L.

4.8.3 QA/QC

Water Matrix Spikes: Water samples are generally spiked with 50ng and 100ng of the basic and acidic compounds, respectively, from the stock standard in duplicate.

Soil Matrix Spikes: Soil or waste samples are generally spiked with 50ng and 100ng of the basic and acidic compounds, respectively, from the stock standard in duplicate.

4.8.4 Instrumentation

Gas Chromatography

Instrument:	HP 6890 Series GC with autosampler
Column:	30m X 0.32mm X 0.25 μ m, HP-5MS
Carrier flow:	Helium at 1.0mL/min.
Detector:	Mass Selective Detector (FID).
Detector temperature:	280°C
Injector temperatures:	280°C
Column oven program:	45°C for 6.0 minutes, 45 to 300°C at 10°C/minute, hold for 5.5 minutes

Section 5: HEALTH AND SAFETY PLAN

A Site Health and Safety Plan will be prepared for the Site characterization in accordance with 29 CFR Occupational Safety and Health Administration requirements.

Tables

TABLE 1
FINAL HEALTH-BASED REMEDIATION GOALS (HBRGS)
FOR BOTH ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)
AND INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)

ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Construction Worker Initial HBRG	Commercial/ Industrial User Initial HBRG	Final HBRG
1-butanol	1.98E+04	3.46E+04	1.98E+04
1,1-dichloroethane	2.23E+03	1.10E+03	1.10E+03
1,1-dichloroethene	1.57E+01	4.21E+00	4.21E+00
1,1,1,2-tetrachloroethane	4.98E+02	1.44E+04	4.98E+02
1,1,2-trichloroethane	2.23E+02	1.26E+03	2.23E+02
1,1,2,2-tetrachloroethane	6.25E+01	1.50E+03	6.25E+01
1,2-dibromo-3-chloropropane	2.42E+00	7.47E+01	2.42E+00
1,2-dibromoethane	4.86E+00	1.84E+02	4.86E+00
1,2-dichlorobenzene	NA	2.64E+06	2.64E+06
1,2-dichloroethane	2.06E+02	2.66E+02	2.06E+02
1,2-dichloropropane	3.37E+01	7.25E+00	7.25E+00
1,2-diphenylhydrazine	2.03E+01	2.36E+08	2.03E+01
1,2,3-trichloropropane	2.39E+00	4.08E+01	2.39E+00
1,2,4-trichlorobenzene	1.74E+02	4.74E+07	1.74E+02
1,3-dichloropropene	4.83E+01	6.63E+02	4.83E+01
1,4-dichlorobenzene	4.32E+02	4.37E+04	4.32E+02
2-butanone	3.28E+04	2.35E+06	3.28E+04
2-chlorophenol	8.57E+02	1.17E+06	8.57E+02
2-methylphenol	8.66E+03	7.59E+07	8.66E+03
2-naphthylamine	9.81E+00	1.63E+06	9.81E+00
2,4-dichlorophenol	5.21E+01	2.22E+07	5.21E+01
2,4-dimethylphenol	3.48E+03	4.37E+08	3.48E+03
2,4-dinitrophenol	3.49E+01	7.14E+09	3.49E+01
2,4-dinitrotoluene	3.48E+01	7.62E+06	3.48E+01
2,4,5-trichlorophenol	1.73E+04	2.21E+08	1.73E+04
2,4,6-trichlorophenol	2.52E+02	1.10E+07	2.52E+02
2,6-dinitrotoluene	2.59E+01	4.51E+05	2.59E+01
3,3-dichlorobenzidine	1.47E+01	7.53E+08	1.47E+01
4-chloroaniline	6.93E+01	6.50E+06	6.93E+01
4-methyl-2-pentanone	1.20E+04	6.84E+05	1.20E+04
4-methylphenol	8.69E+01	4.01E+07	8.69E+01
4,4-ddd	1.03E+02	9.97E+08	1.03E+02

TABLE 1
FINAL HEALTH-BASED REMEDIATION GOALS (HBRGS)
FOR BOTH ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)
AND INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)

ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Construction Worker Initial HBRG	Commercial/ Industrial User Initial HBRG	Final HBRG
4,4-dde	7.28E+01	2.83E+06	7.28E+01
4,4-ddt	1.22E+01	2.26E+08	1.22E+01
acenaphthene	8.10E+03	1.62E+08	8.10E+03
acetone	1.55E+04	4.37E+05	1.55E+04
acrolein	NA	8.05E+01	8.05E+01
acrylonitrile	1.59E+01	7.65E+01	1.59E+01
aldrin	7.32E-01	2.82E+04	7.32E-01
alpha-bhc	3.93E+00	2.32E+05	3.93E+00
aniline	3.10E+03	1.02E+07	3.10E+03
anthracene	4.06E+03	1.37E+10	4.06E+03
aroclor 1016	NA	7.35E+05	7.35E+05
aroclor 1254	8.70E-01	5.69E+05	8.70E-01
benzene	1.43E+02	1.71E+02	1.43E+02
benzidine	3.52E-02	1.55E+02	3.52E-02
benzoic acid	6.96E+04	6.58E+10	6.96E+04
benzo(a)anthracene	1.14E+01	1.13E+09	1.14E+01
benzo(a)pyrene	1.14E+00	9.56E+07	1.14E+00
benzo(b)fluoranthene	1.14E+01	3.19E+08	1.14E+01
benzo(k)fluoranthene	1.14E+01	9.56E+07	1.14E+01
benzyl alcohol	1.73E+04	3.81E+08	1.73E+04
benzyl chloride	1.00E+02	4.03E+03	1.00E+02
beta-bhc	1.38E+01	9.94E+06	1.38E+01
beta-chloronaphthalene	NA	2.32E+07	2.32E+07
bis(2-chloro-1-methylethyl)ether	2.49E+02	2.93E+04	2.49E+02
bis(2-chloroethyl)ether	6.91E+00	6.91E+02	6.91E+00
bis(2-ethylhexyl)phthalate	2.10E+03	3.59E+09	2.10E+03
bromodichloromethane	1.30E+02	2.94E+03	1.30E+02
bromoform	3.34E+02	1.28E+05	3.34E+02
bromomethane	NA	1.15E+02	1.15E+02
carbazole	8.83E+02	6.66E+08	8.83E+02
carbon disulfide	1.43E+03	7.04E+04	1.43E+03
carbon tetrachloride	9.71E+01	1.35E+02	9.71E+01

**TABLE 1
FINAL HEALTH-BASED REMEDIATION GOALS (HBRGS)
FOR BOTH ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)
AND INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)**

ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Construction Worker Initial HBRG	Commercial/ Industrial User Initial HBRG	Final HBRG
chlordane	1.04E+00	1.55E+05	1.04E+00
chlorobenzene	NA	2.83E+04	2.83E+04
chloroform	1.49E+02	9.58E+02	1.49E+02
chloromethane	7.43E+02	7.40E+01	7.40E+01
chrysene	1.14E+02	5.06E+10	1.14E+02
cis-1,2-dichloroethene	1.34E+03	7.51E+03	1.34E+03
cumene	3.79E+03	5.73E+04	3.79E+03
dibenzo(a,h)anthracene	3.35E+00	6.34E+11	3.35E+00
dibromochloromethane	1.50E+02	1.54E+02	1.50E+02
dichlorodifluoromethane	2.14E+03	7.01E+02	7.01E+02
dieldrin	1.22E+00	2.33E+04	1.22E+00
diethyl phthalate	1.39E+05	6.03E+09	1.39E+05
di-n-butylphthalate	1.74E+04	4.19E+08	1.74E+04
di-n-octylphthalate	3.49E+02	1.80E+10	3.49E+02
endosulfan	1.46E+02	2.14E+08	1.46E+02
endrin	7.33E+00	1.37E+08	7.33E+00
ethyl chloride	1.42E+05	1.57E+06	1.42E+05
ethylbenzene	NA	7.33E+05	7.33E+05
fluoranthene	6.97E+03	3.03E+10	6.97E+03
fluorene	6.94E+03	1.40E+08	6.94E+03
gamma-bhc	2.32E+01	2.63E+05	2.32E+01
heptachlor	2.87E+00	1.78E+03	2.87E+00
heptachlor epoxide	3.14E-01	1.35E+03	3.14E-01
hexachlorobenzene	9.69E+00	2.80E+03	9.69E+00
hexachlorobutadiene	2.24E+02	7.13E+04	2.24E+02
hexachlorocyclopentadiene	8.87E+01	9.79E+02	8.87E+01
hexachloroethane	1.73E+02	2.39E+05	1.73E+02
indeno(1,2,3-cd)pyrene	1.47E+01	1.23E+11	1.47E+01
isobutyl alcohol	4.81E+04	2.55E+06	4.81E+04
isophorone	1.85E+04	2.92E+07	1.85E+04
methoxychlor	8.71E+01	1.48E+09	8.71E+01
methyl methacrylate	1.06E+03	5.56E+04	1.06E+03

TABLE 1
FINAL HEALTH-BASED REMEDIATION GOALS (HBRGS)
FOR BOTH ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)
AND INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)

ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Construction Worker Initial HBRG	Commercial/ Industrial User Initial HBRG	Final HBRG
methylene bromide	1.51E+03	2.75E+04	1.51E+03
methylene chloride	1.07E+03	1.26E+03	1.07E+03
methyl-tert-butyl ether	NA	1.39E+06	1.39E+06
n-butylbenzyl phthalate	3.48E+03	6.52E+09	3.48E+03
nitroaniline, o-	8.07E+03	2.45E+06	8.07E+03
nitrobenzene	8.61E+01	1.78E+05	8.61E+01
nitrosodiphenylamine, p-	8.02E+02	1.03E+07	8.02E+02
n-nitrosodimethylamine	2.60E-01	1.38E-02	1.38E-02
n-nitroso-di-n-propylamine	2.48E+00	4.46E+02	2.48E+00
n-nitrosodiphenylamine	1.96E+03	4.80E+09	1.96E+03
o-chlorotoluene	3.14E+03	1.05E+05	3.14E+03
p-chloro-m-cresol	3.48E+04	NA	3.48E+04
pentachlorophenol	3.04E+02	3.09E+07	3.04E+02
phenol	1.04E+04	3.14E+09	1.04E+04
pyrene	2.35E+03	4.11E+10	2.35E+03
styrene	3.02E+05	7.58E+06	3.02E+05
tetrachloroethene	3.36E+02	7.52E+03	3.36E+02
toluene	3.12E+04	2.41E+05	3.12E+04
toxaphene	1.47E+01	9.16E+04	1.47E+01
trans-1,2-dichloroethene	2.68E+03	1.47E+04	2.68E+03
trichloroethene	1.05E+03	1.39E+03	1.05E+03
trichlorofluoromethane	1.03E+04	4.89E+04	1.03E+04
vinyl acetate	5.41E+03	2.31E+05	5.41E+03
vinyl chloride	5.16E+00	1.81E-01	1.81E-01
xylenes	3.26E+04	2.61E+07	3.26E+04
INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Initial HBRG	ILM Background*	Final HBRG
aluminum	NT	3.63E+04	3.63E+04
antimony	9.05E+00	5.00E+00	9.05E+00
arsenic	8.87E+00	1.40E+01	1.40E+01
Barium	2.52E+03	2.81E+02	2.52E+03
beryllium	1.56E+01	7.40E-01	1.56E+01

TABLE 1
FINAL HEALTH-BASED REMEDIATION GOALS (HBRGS)
FOR BOTH ORGANIC CONSTITUENTS, SOIL EXPOSURE PATHWAYS (mg/kg)
AND INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)

INORGANIC COMPOUNDS, SOIL EXPOSURE PATHWAYS (mg/kg)			
Constituent	Initial HBRG	ILM Background*	Final HBRG
cadmium	1.64E+01	8.80E-01	1.64E+01
calcium	NT	3.80E+04	3.80E+04
chromium iii	3.22E+04	4.10E+01	3.22E+04
chromium vi	9.73E+01	NA	9.73E+01
cobalt	NT	2.00E+01	2.00E+01
copper	1.26E+03	5.30E+01	1.26E+03
cyanide	6.99E+02	NA	6.99E+02
iron	NT	6.05E+04	6.05E+04
lead	NT	1.11E+02	1.11E+02
mercury	6.78E+00	2.80E-01	6.78E+00
molybdenum	1.24E+03	2.30E+01	1.24E+03
nickel	2.39E+02	2.90E+01	2.39E+02
potassium	NT	8.26E+03	8.26E+03
selenium	1.82E+02	1.24E+03	1.24E+03
silver	1.30E+02	2.39E+02	2.39E+02
sodium	NT	1.96E+03	1.96E+03
thallium	NT	1.10E+01	1.10E+01
titanium	NT	1.95E+03	1.95E+03
vanadium	8.37E+01	8.20E+01	8.37E+01
zinc	8.73E+03	1.98E+02	8.73E+03

NOTES:

*ILM background values provided in Baseline Risk Assessment (G&M 1996). See Appendix E.

NT = No Toxicity values available for calculation of HBRG

NA = Not Available.

**TABLE 2
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 1
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00**

Bldg. No.	Feature Location	Feature No.	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	s	Metals	Cr+6	TPH	PCBs	pH	
1	North of Building 1	1	Oil Storage Area	Oil Storage	TPH,	0										
1	East of Building 1	2	Coolant Reclamation System w/ four	Storage of coolants	TPH, metals	0										
1	East of Building 1	3	Coolant Reclamation System	Storage of coolants	TPH, metals	1	10	1.5,10								
1	East of Building 1	4	Chrome Removal System	Use of solvents or etchants for removal of chrome	VOCs, metals	0										
1	East of Building 1	5	Chrome Removal Tank	Storage of solvents or etchants	VOCs, metals	1	20	1.5,10								
1	East of Building 1	6	Ultra Filter (Waste Coolant) 6,500 gallon	Storage of waste coolant	TPH, VOCs, metals	1	20	1.5,10,15								
1	Northwest quadrant of Building 1	7	Fuel tanks	Storage of fuels	TPH	1	10	1.5,10								
1	Northwest quadrant of Building 1	7A	Fuel tanks	Storage of fuels	TPH	1	10	1.5,10								
1	Basement-Northwest quadrant of Building 1	8	AST	Storage of unknown fluid	VOCs, TPH, SVOCs, metals	1	10	1.5,10								
1	Southeast quadrant of Building 1	9	Lead Burner	Metal processing	TPH, SVOCs, metals	1	10	1.5,10								
1	Basement - Southeast quadrant of Building 1	42	Paint Stripping System (Five Tanks & Oven)	Storage and use of fuels, solvents, and/or etchants	TPH, VOCs, metals, pH, acid salts	1	10	1.5,10								
1	Southeast quadrant of Building 1	43	Machine shop area	Storage of solvents	TPH, VOCs, metals	1	10	1.5,10								
1	North of Building 1	A1	Aboveground Solvent Storage Tanks	Storage of solvents	VOCs, SVOCs	0										
1	North of Building 1	A2	Aboveground Storage Tank (possibly for PCB oil transformers)	Transformers	TPH, PCBs	2	10	1.5,10								
1	Northwest quadrant of Building 1	A3	Aboveground degreaser tanks	Storage of solvents or etchants	VOCs, metals, pH	2	10	1.5,10								
1	South of Building 1	A6	Caustic Storage AST Area	Storage of the caustic solutions used in the Aluminum Chemical Mill	metals, pH, acid salts	0										
1	Southwest quadrant of Building 1	A14	Degreaser	Storage of solvents or etchants	TPH, VOCs, metals	1	20	1.5,10,15								
1	West of Building 1	A22	Old Chemical Mill	Chemical storage and metal	TPH, VOCs, metals	1	10	1.5,10								
1	Northwest quadrant of Building 1	A23	Degreaser AST (TCE)	Chemical storage and metal	VOCs, metals	1	10	1.5,10								
1	Southeast quadrant of Building 1	A24	2 Process ASTs	Chemical storage and/or metal processing	VOCs, metals	1	10	1.5,10								
1	Northeast quadrant of Building 1	C1	Sewer	Transport of sewage	TPH, VOCs, metals	0										
1	North of Building 1	D1	Drains	Collection of rainfall and runoff	Metals	0										
1	East of Building 1	D2	Drain	Collection of rainfall and possible runoff from the Aluminum Chemical Mill (U4)	Metals	1	10	1.5,10								
1	South of Building 1	D6	Drain	Collection of rainfall and possibly runoff from the caustic storage tanks	Metals, pH, TPH	1	10	1.5,10								
1	South of Building 1	D7	Drain	Collection of rainfall and possibly runoff from the caustic storage tanks	Metals, pH, VOCs	1	10	5,10								

**TABLE 2
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 1
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00**

Bldg. No.	Feature Location	Feature No.	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	s	Metals	Cr+6	TPH	PCBs	pH	
1	South of Building 1	D8	Drain	Collection of rainfall and possibly runoff from the caustic storage tanks	VOCs, metals, pH	1	10	1,5,10	x		x					x
1	Basement-Southeast quadrant of Building 1	D17	Drain	Collection of fluids from the paint stripping system and paintbooths	TPH, VOCs, metals, pH, acid salts	0										
1	Northeast quadrant of Building 1	F1	Bermed Area Inside the Aluminum Chemical Mill	Storage of fuels, and use of etchants and caustics in the Aluminum Chemical Mill.	VOCs, SVOCs, TPH, metals, and hexavalent chromium	1	10	1,5,10	x	x	x	x				
1	Northeast quadrant of Building 1	F2	Machine Foundations	Support for machinery	TPH	2	10	1,5,10								x
1	Southeast quadrant of Building 1	F3	Machine Pit	Support for machinery	TPH	1	15	5,10,15								x
1	Southeast quadrant of Building 1	F4	Machine Foundation with gas and drain	Support for machinery	TPH	1	15	5,10,15								x
1	South of Building 1	F5	Aluminum Chemical Mill	Metal processing using caustic	Metals, pH	1	10	1,5,10			x					x
1	South of Building 1	F6	Anodizing Process System	Metal processing area	VOCs, metals, pH	1	10	1,5,10	x		x					x
1	Northwest quadrant of Building 1	F7	Titanium Processing System	Metal processing	VOCs, metals, pH, SVOCs	3	15	5,10,15	x		x					
1	Northwest quadrant of Building 1	F8	Fuel Oil Pump House	Transport of fuel oil	TPH, SVOCs	2	15	1,5,10			x					x
1	North of Building 1	F24	Hydraulic Press	Metal finishing	TPH, metals	0										
1	Northeast quadrant of Building 1	F25	Router with conveyor	Metal finishing	TPH, metals	1	5	1,5							x	
1	North of Building 1	P19	Paint Storage Area	Paint Storage	VOCs	0										
1	Basement-Northeast quadrant of Building 1	P20	Paintbooths	Use of paints	VOCs, metals	0										
1	North of Building 1	S1	Variac Mill (oil and coolant pits)	Storage of petroleum hydrocarbons and coolants	VOCs, TPH	0										
1	East of Building 1	S2	Mixing Chamber of Painting Process	Paint Mixing Area	VOCs, metals	1	10	1,5,10	x							
1	Northeast quadrant of Building 1	S3	Clarifier - Anodizing / Paint Machine	Collection of waste oil	TPH, VOCs, metals	0										
1	Southwest quadrant of Building 1	S5	Tar Settling Basin, Hot Presses, and Drop Hammer Pits	Metal processing	TPH, VOCs, SVOCs, metals	4	30	20,25,30	x	x	x					x
1	Southwest quadrant of Building 1	S10A	Aluminum Cleaning System (Three Tanks and One Clarifier)		VOCs, metals	1	20	5,10,15,20	x		x					
1	South of Building 1	S11	Support Cavity	Possibly to support caustic storage	Metals, pH	1	10	5,10								x
1	South of Building 1	S12	Support Cavity	Possibly to support caustic storage	Metals, pH	1	10	5,10								x
1	Basement-Northwest quadrant of Building 1	S41	Vault		PHH, PCBs	0										
1	Basement-Southeast quadrant of Building 1	S42	Clarifier			0										
1	Northwest quadrant of Building 1	S43	Aluminum Anodizing System (Clarifier, Tanks, and Degreaser)		VOCs, metals, pH	1	15	5,10,15	x		x					x

TABLE 2
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 1
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00

Bldg. No.	Feature Location	Feature No.	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	\$	Metals	Cr+6	TPH	PCBs	pH	
1	Northeast quadrant of Building 1	S49	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S50	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S51	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S52	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	1	10	1,5,10								x
1	Northeast quadrant of Building 1	S53	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S54	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S55	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S56	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	0										
1	Northeast quadrant of Building 1	S57	Pit	Located in the Punch Press Area depicted in the 1996 Phase I by K/J	TPH, metals	1	10	1,5,10								x
1	Northwest quadrant of Building 1	S58	Pit	Located in the Miscellaneous Area depicted in the 1996 Phase I by K/J	VOCs, metals, TPH	0										
1	Northwest quadrant of Building 1	S59	Pit	Located in an unused area-possibly a small part fabrication area at some point in time	VOCs, metals, TPH	1	5	1,5	x						x	
1	Southwest quadrant of Building 1	S60	Pit in Aluminum Cleaning System Area		VOCs,metals	1	10	1,5,10	x							
1	Southwest quadrant of Building 1	S61	Pit in Heat Treat Furnace Area	Metal processing	TPH, SVOCs, metals,,	1	20	1,5,10,15,	x	x					x	
1	Southwest quadrant of Building 1	S62	Pit in Heat Treat Furnace Area	Metal processing	TPH, SVOCs	0										
1	Southwest quadrant of Building 1	S63	Pit in Heat Treat Furnace Area	Metal processing	TPH, SVOCs	0										
1	Basement-Northwest quadrant of Building 1	T2	Power Substation	Use of PCB oils in transformers	PCBs, TPH	1	10	1,5							x	x
1	North of Building 1	U1	Underground Storage Tanks Area (one 3,000-gallon waste solvent and three 5,000-gallon solvent tanks)	Storage of solvents and waste solvent	VOCs, SVOCs	0										
1	North of Building 1	U2	130 gallon underground diesel storage	Storage of Diesel	TPH	1	20	10,15,20								x

**TABLE 2
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 1
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00**

Bldg. No.	Feature Location	Feature No.	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	\$	Metals	Cr+6	TPH	PCBs	pH	
1	East of Building 1	U3	Underground hydraulic oil storage tanks; Oil Filter System, removed in 1991 (two 7,500 and two 500 gallon tanks)	Storage of hydraulic oils	TPH	0										
1	Northeast quadrant of Building 1	U4	Aluminum Chemical Mill Using Etchant and Caustics. Also possibly several large underground fuel storage tanks.	Storage of fuels, and use of etchants and caustics in the Aluminum Chemical Mill.	TPH, metals, pH, acid salts	0										
1	Northwest quadrant of Building 1	U5	Four 7,500 gallon fuel oil Underground Storage Tanks	Storage of fuels	TPH, VOCs	2	25	10,15,20	x		x					
1	Southwest quadrant of Building 1	U17	UST in Heat Treat Area	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Southwest quadrant of Building 1	U18	UST in Heat Treat Area	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Southwest quadrant of Building 1	U19	UST in Trim Saw Router Area	Unknown	TPH, VOCs, SVOCs,	0										
1	North of Building 1	U20	UST west of the Utility/Maintenance	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Northeast quadrant of Building 1	U21	UST in Punch Press Area, near TMW-2	Unknown	TPH, VOCs, SVOCs,	0										
1	Northeast quadrant of Building 1	U22	UST in Punch Press Area	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Northeast quadrant of Building 1	U23	UST in Punch Press Area	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Northwest quadrant of Building 1	U24	UST in Degreaser Tank Area	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Northwest quadrant of Building 1	U25	UST in Aluminum Anodizing System	Unknown	TPH, VOCs, SVOCs,	1	20	10,15,20	x		x					
1	Southwest quadrant of Building 1	U27	UST in Aluminum Cleaning System	Unknown	VOCs, metals	0										
1	Southwest quadrant of Building 1	U28	UST in Heat Treat Furnace Area	Unknown	TPH, VOCs, SVOCs,	0										

Notes:

- A Above ground storage tank
 - C Wet utility corridor
 - D Drain
 - F Equipment foundation
 - P Spray booth
 - S Pit, sump, clarifier
 - T Transformer, electrical substation
 - U Underground storage tank
- denotes multiple borings within the same feature

TABLE 3
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 3
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00

Bldg. No.	Feature Location	Feature No. on Figure 4	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	s	Metals	Cr+6	TPH	PCBs	pH	
3	Southwest quadrant inside Building 3	18	Chemical Lab	Testing of chemical compounds	TPH, VOCs, SVOCs, metals	1	10	1,5,10	X	X	X			X		
3	Southwest quadrant inside Building 3	P1	Paint Lab	Testing of paints	Metals, VOCs, SVOCs	1	10	1,5,10	X	X	X					
3	Northwest quadrant inside Building 3	T14	Transformer	Possibly PCB containing	PCBs, TPH	1	5	1,5						X	X	
3	Inside Building 3	T15	Transformer	Possibly PCB containing	PCBs, TPH											
3	West of Building 3	U16	80 gallon Gasoline	Storage of gasoline	TPH, VOCs	1	20	10,15,20	X					X		

- A Above ground storage tank
- C Wet utility corridor
- D Drain
- F Equipment foundation
- P Spray booth
- S Pit, sump, clarifier
- T Transformer, electrical substation
- U Underground storage tank

TABLE 3
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 3
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00

Bldg. No.	Feature Location	Feature No. on Figure 4	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	s	Metals	Cr+6	TPH	PCBs	pH	
3	Southwest quadrant inside Building 3	18	Chemical Lab	Testing of chemical compounds	TPH, VOCs, SVOCs, metals	1	10	1,5,10	X	X	X			X		
3	Southwest quadrant inside Building 3	P1	Paint Lab	Testing of paints	Metals, VOCs, SVOCs	1	10	1,5,10	X	X	X					
3	Northwest quadrant inside Building 3	T14	Transformer	Possibly PCB containing	PCBs, TPH	1	5	1,5						X		X
3	Inside Building 3	T15	Transformer	Possibly PCB containing	PCBs, TPH											
3	West of Building 3	U16	80 gallon Gasoline	Storage of gasoline	TPH, VOCs	1	20	10,15,20	X					X		

- A Above ground storage tank
- C Wet utility corridor
- D Drain
- F Equipment foundation
- P Spray booth
- S Pit, sump, clarifier
- T Transformer, electrical substation
- U Underground storage tank

TABLE 4
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 20
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00

Bldg. No.	Feature Location	Feature No. on Figure	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	SVOCs	Metals	Cr+6	TPH	PCBs	pH	
20	Inside Building 20	13	Battery Storage Area	Storage of batteries	Acids, metals	0*										
20	Inside Building 20	14	Battery Storage Area	Storage of batteries	Acid salts, metals	1	5	1.5		x				x		x
20	Inside Building 20	15	Coolant Use Area	Use of coolants	TPH, metals	0*										
20	Inside Building 20	55	Auto Maintenance		TPH, VOCs, metals	2	5	1.5	x					x		
20	North of Building 20	A4	Aboveground Fuel Storage Tank	Storage of fuel	TPH	1	10	1.5,10							x	
20	Inside Building 20	A5	Aboveground 1,000 gallon Motor Oil Tank	Storage of motor oil	TPH	0*										
20	North of Building 20	D4	Drain	To collect rainfall and runoff	ND from TMMW-16	0*										
20	Inside Building 20	D5	Drain	To collect runoff from the storage and cleaning operations in Building 20	TPH, VOCs, metals	0*										
20	Inside Building 20	S8	Clarifier	Collection of waste oil and coolants from cleaning water	TPH, VOCs, metals	0*										
20	Northeast quadrant inside Building 20	S9	Pit	NA	NA	1		1.5,10	x						x	
20	Southwest quadrant inside Building 20	S10	Condensate Pit	NA	TPH	0*										
20	Northwest quadrant inside Building 20	U14	Hydraulic Lift and Control	Use of hydraulic oil for lift	TPH	1	15	5,10,15								x

Notes:

- A Above ground storage tank
- C Wet utility corridor
- D Drain
- F Equipment foundation
- P Spray booth
- S Pit, sump, clarifier
- T Transformer, electrical substation
- U Underground storage tank
- Both** denotes multiple boring within the same feature
- * Soil boring and sampling previously completed

**TABLE 5
 SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 32
 Boeing C-6 Facility Parcel C
 Los Angeles, California
 K/J 004026.00**

Bldg. No.	Feature Location	Feature No. on Figure 5	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Boring Depth	Sampling Depths	PROPOSED ANALYTICAL PROGRAM							
									VOCs	SVOCs	Metals	Cr+6	TPH	PCBs	pH	
32	North of Building 32	10	Transfer Area (Three Container Waste Collectors)	Storage of paint waste	TPH, VOCs, metals	1	10	1,5,10	x		x			x		
32	North of Building 32	11	Paint Area (10,000 gallon Waste Container Tanks)	Storage of paint waste	VOCs, metals	1	20	5,10,15,20	x							
32	North of Building 32	12	Plant Services Paint Storage Area	Storage of paint waste	VOCs, metals	1	15	5,10,15,20	x							
32	North of Building 32	D3	Drain	Collection of rainfall and runoff	TPH, VOCs, metals	1	10	1,5,10	x					x		
32	North of Building 32	S6	Covered Pit	NA	TPH, VOCs, metals	1	10	5,10	x					x		
32	North of Building 32	S7	Clarifier	Possibly used to collect waste paint from water	TPH, VOCs, metals	1	20	10,15,20	x					x		
32	North of Building 32	U6	Underground Storage Tank	Storage of unknown fluid	TPH, VOCs, metals	1	20	10,15,20	x					x		
32	West of Building 32	U7	10,000 gallon Underground Storage Tank	Storage of unknown fluid	TPH, VOCs, metals	1	20	10,15,20	x					x		
32	North end and outside NE corner of	X1 & X2	Step out borings from previous soil boring 2BB-5-20		TPH, metals	2	5	1, 5						x		

Notes:
 A Above ground storage tank
 C Wet utility corridor
 U Drain
 F Equipment foundation
 P Spray booth
 S Pit, sump, clarifier
 I Transformer, electrical substation
 U Underground storage tank
 X Step-out borings

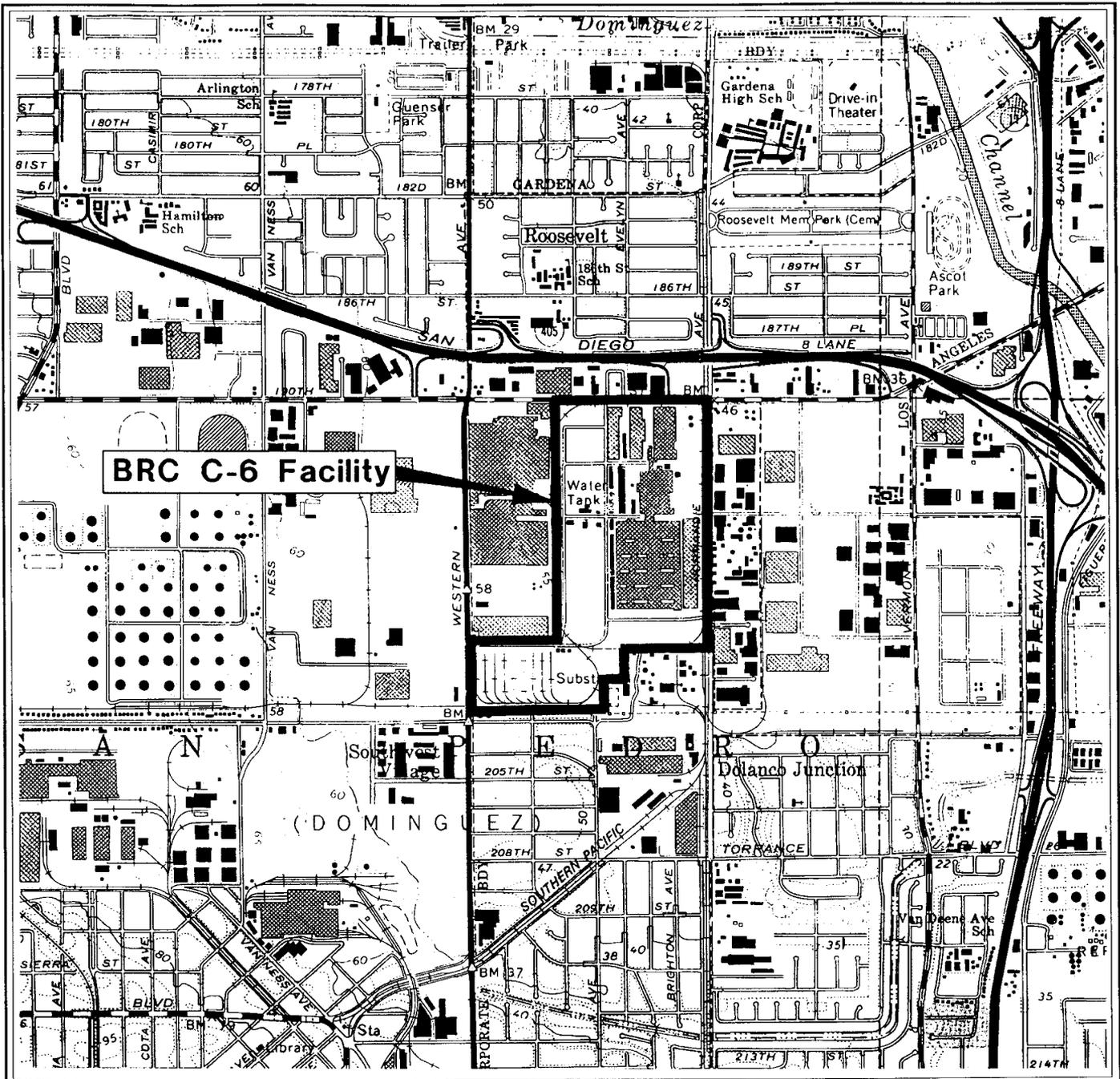
**TABLE 6
QUALITY ASSURANCE CRITERIA**

COMPONENT	PRECISION RPD (Max.)	ACCURACY %Recovery	Reporting Limit	ACCURACY %Recovery	Reporting Limit
TOTAL PETROLEUM HYDROCARBONS - EPA Method 8015 Modified					
		Water	mg/L	Soil	mg/kg
Gasoline	15	70-118	0.05	60-130	50
CCID	15	30-140	0.5	50-125	8.0
TOTAL METALS WITH HEXAVALENT CHROMIUM - EPA Method 6010/7196					
		Water	mg/L	Soil	mg/kg
Antimony	15	67-168	0.1	83-120	5.0
Arsenic	15	82-120	0.1	85-120	1.0
Barium	15	80-118	0.01	78-112	0.5
Beryllium	15	86-120	0.01	91-119	0.5
Cadmium	15	86-117	0.01	85-116	0.5
Chromium (VI)	15	80-120	0.01	80-120	0.5
Chromium	15	85-117	0.01	83-113	0.5
Cobalt	15	77-122	0.01	79-111	0.5
Copper	15	73-143	0.01	82-127	0.5
Lead	15	79-118	0.05	73-115	1.0
Mercury	15	76-103	0.001	79-115	0.1
Molybdenum	15	67-133	0.05	80-113	1.0
Nickel	15	83-121	0.01	84-116	0.5
Selenium	15	82-120	0.1	81-122	1.0
Silver	15	79-118	0.01	85-116	0.5
Thallium	15	81-117	0.1	73-107	5.0
Vanadium	15	79-124	0.01	85-113	0.5
Zinc	15	68-128	0.01	65-125	0.5
POLYCHLORINATED BIPHENYLS - EPA Method 8082					
		Water	µg/L	Soil	µg/kg
PCB-1260	20	14-156	5.0	37-209	50
VOLATILE ORGANIC HYDROCARBONS - EPA Method 8260					
		Water	µg/L	Soil	µg/kg
1,1-Dichloroethene	15	61-145	0.5	2.5	59-172
Benzene	15	76-127	0.5	2.5	66-142
Trichloroethene	15	71-120	0.5	2.5	62-137
Toluene	15	76-125	0.5	2.5	59-139
Chlorobenzene	15	75-127	0.5	2.5	60-133
SEMI-VOLATILE ORGANIC HYDROCARBONS - EPA Method 8270					

**TABLE 6
QUALITY ASSURANCE CRITERIA**

COMPONENT	PRECISION RPD (Max.)	ACCURACY	Reporting	ACCURACY	Reporting
		%Recovery	Limit	%Recovery	Limit
		Water	ng	Soil	ng
Phenol	15	5.0	12-89	100	26-90
2-Chlorophenol	15	5.0	27-123	100	25-102
1,4-Dichlorobenzene	15	5.0	36-97	100	28-104
n-Nitroso-di-n-propylamine	15	5.0	41-116	100	41-126
1,2,4-Trichlorobenzene	15	5.0	39-107	100	37-107
4-Chloro-3-Methylphenol	15	5.0	23-97	100	26-103
Acenaphthene	15	5.0	24-96	100	31-137
Pentachlorophenol	15	5.0	9-103	250	17-109
Pyrene	15	5.0	26-127	100	35-142

Figures



Source: Basemap modified from
 U.S.G.S. Torrance, California
 7.5 Minute Quadrangle
 Photorevised 1981

Kennedy/Jenks Consultants

Boeing Realty Corporation
 C-6 Facility

0 2000 4000



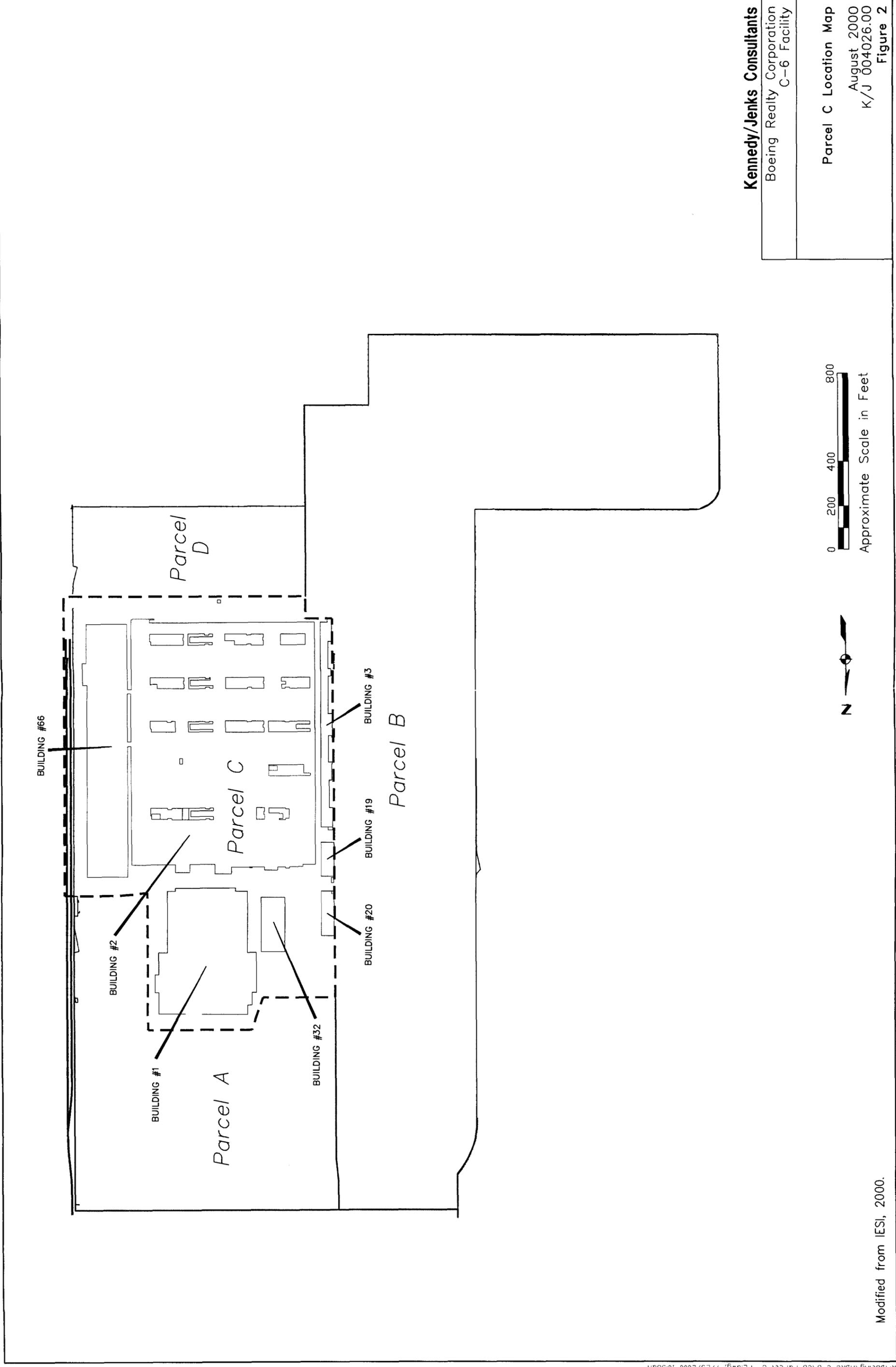
Approximate Scale in Feet



Site Location Map

August 2000
 K/J 004026.00

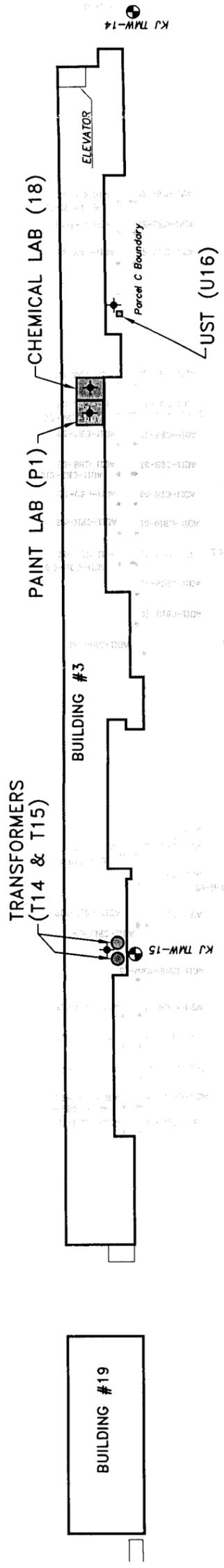
Figure 1



Modified from IESI, 2000.

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 Boeing Realty Corporation
 C-6 Facility

Parcel C Location Map
 August 2000
 K/J 004026.00
 Figure 2

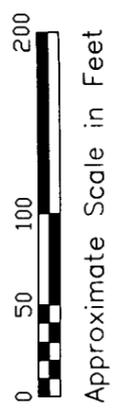


EXPLANATION

- ⊙ PREVIOUSLY COMPLETED SOIL BORING
- ⊙ KJ TMW-15 TEMPORARY GROUNDWATER MONITORING WELL
- ⊙ PROPOSED SOIL BORING LOCATION
- AREA OR FEATURE OF CONCERN

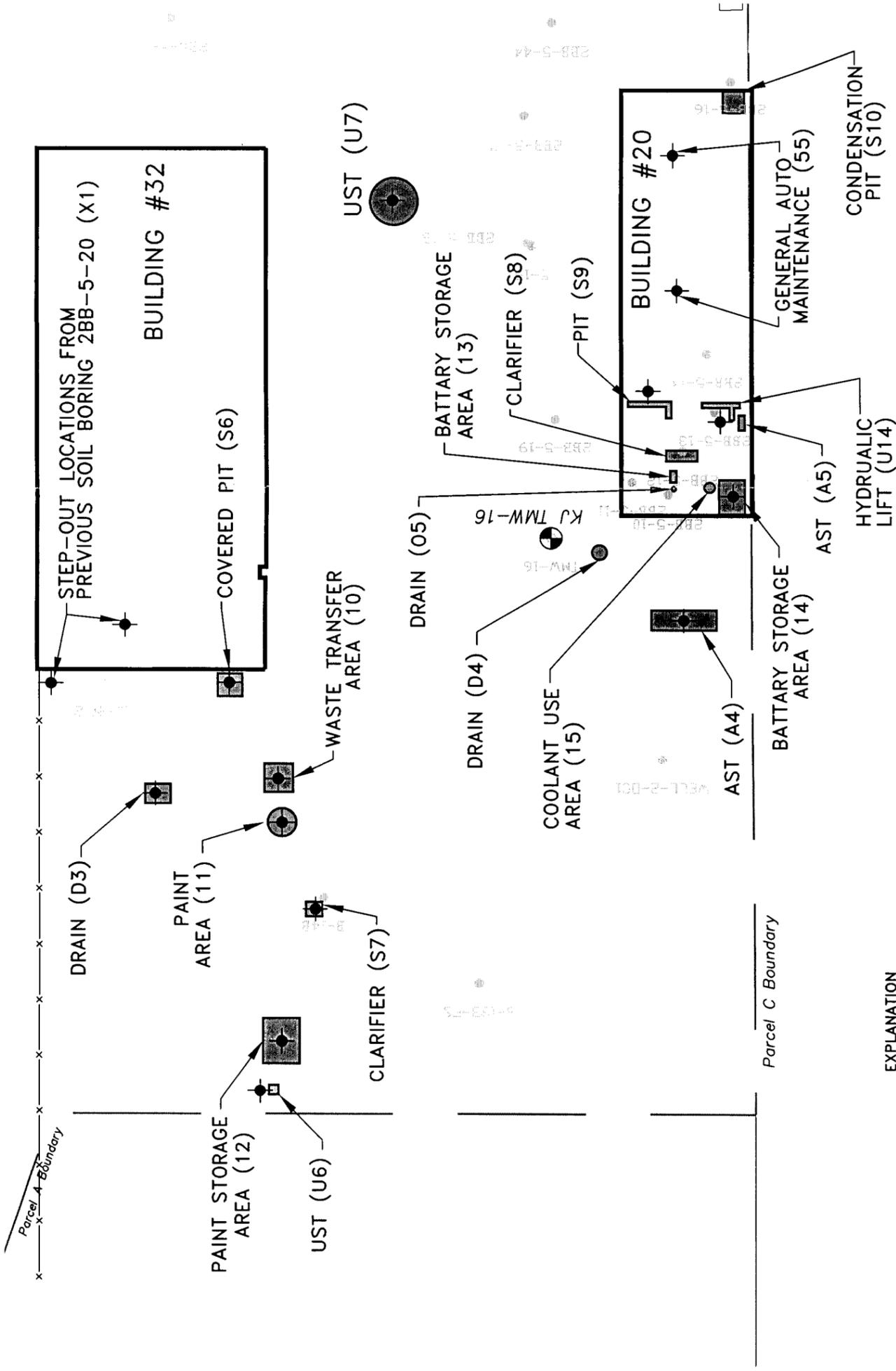
CHEMICAL LAB (18) NUMBER IN () REFERS TO FEATURE NO. ON TABLE 3.

NOTE: REFER TO TABLE 3 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.



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 C-6 Facility
 Parcel C, Buildings 3 & 19
 Areas of Concern and
 Proposed Soil Boring Locations
 August 2000
 K/J 004026.00
 Figure 4

Modified from IESI, 2000.



EXPLANATION

- PREVIOUSLY COMPLETED SOIL BORING
- TEMPORARY GROUNDWATER MONITORING WELL
- PROPOSED SOIL BORING LOCATION
- AREA OR FEATURE OF CONCERN
- DRAIN (D4)** NUMBER IN () REFERS TO FEATURE NO. ON TABLES 4 AND 5.

NOTE: REFER TO TABLE 4 AND 5 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.



Approximate Scale in Feet

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 C-6 Facility

Parcel C, Buildings 20 & 32
 Areas of Concern and
 Proposed Soil Boring Locations

August 2000
 K/J 004026.00
 Figure 5

Modified from IESI, 2000.

Kennedy/Jenks Consultants

Engineers & Scientists

2151 Michelson Drive
Suite 100
Irvine, California 92612-1311
949-261-1577
FAX 949-261-2134

12 September 2000

Mr. John Geroch
Associate Engineering Geologist
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Addendum A to the Sampling and Analysis Plan
Boeing Realty Corporation's C-6 Facility, Parcel C
K/J 004032.00

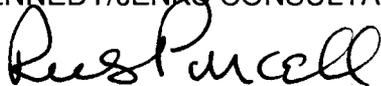
Dear Mr. Geroch:

Enclosed please find Addendum A to the Sampling and Analysis Plan for Parcel C of Boeing Realty Corporation's C-6 Facility. The tables and figures have been modified to reflect the discussion comments at our meeting held on 30 August 2000 at the Boeing Long Beach Visitors Center.

If you have any questions, please contact Mr. Rus Purcell or Mr. Jay Knight of Kennedy/Jenks at (949) 261-1577.

Very truly yours,

KENNEDY/JENKS CONSULTANTS



Charles (Rus) Purcell, R.G.
Manager of Geosciences

Enclosure

Kennedy/Jenks Consultants

2151 Michelson Drive, Suite 100
Irvine, California 92612-1311

**ADDENDUM A
SAMPLING AND ANALYSIS PLAN
Boeing Realty Corporation's
C-6 Facility – Parcel C
Los Angeles, California**

12 September 2000

Prepared for

Boeing Realty Corporation
4060 Lakewood Boulevard, 6th Floor
Long Beach, CA 90808

K/J 004026.00

Boeing Realty Corporation's C-6 Facility – Parcel C ADDENDUM A TO THE SAMPLING AND ANALYSIS PLAN

Addendum A to the Sampling and Analysis Plan (SAP) dated 16 August 2000, and approved in a letter dated 18 August 2000, for Parcel C of the Boeing Realty Corporation's C-6 facility is presented herein. The SAP covered Buildings 1, 3, 19, 20, and 32 and presented a description of each building, the sampling rationale, item-specific chemicals of concern, sampling scheme at each sampling location, and the analyses to be performed.

This Addendum to the SAP serves to include Buildings 2 and 66 into the SAP for Parcel C of BRC's C-6 facility. All field and laboratory methodologies are identical to those listed in the SAP. Therefore, this addendum will only include a Building description, together with a detailed sampling and analysis matrix table and Figures, based on discussions held on 30 August 2000 during the preliminary review meeting of the Addendum. For ease of discussion and presenting, Buildings 2 and 66 have been divided into four quadrants as follows:

- Table A1 and Figure A1 (northeast quadrant)
 - Table A2 and Figure A2 (southeast quadrant)
 - Table A3 and Figure A3 (northwest quadrant)
 - Table A4 and Figure A4 (southwest quadrant)
 - Table A5 and Figures A5 and A6 (Building 66)
- **Building 2** – Building 2 is an approximately 1,000,000 sq. ft. structure that was used as a parts assembly and parts storage warehouse. Aerial photographs show that activities in the building included aluminum reduction operations at the time of its construction. More recent activities have included aircraft parts manufacturing and assembly.

The building is divided into six east-west wings that are separated from each other by outdoor patio areas. The patio areas are not continuous across the length of the structure; there are four separate patio areas between each east-west wing. Uses of each of the patios vary. Some of the patio areas have been improved with the construction of two-story office structures. Other patio areas were used as recreation areas or work areas. Four mezzanine levels, also used for storage, are located at various locations in the building.

Continuous aiseways traverse the north-south length of the structure through the center, on the west side, and on the east side. The center aiseway is continuous northward out of Building 2, through an enclosed area between Building 1 and 2, and through Building 1.

- **Building 66** – Building 66 is an approximately 200,000 square foot warehouse that was constructed in 1972. Prior to its construction, this area of the facility was a storage yard. Other activities in the building include the assembly of shipping supplies and light tool cutting.

Because of the size of Building 2 ($\pm 1,000,000$ ft.), the sampling rationale has been expanded to include grid samples in large process areas and open space areas throughout Buildings 2 and 66. These areas are called out separately on Tables A1 through A5 and shown on Figures A1 through A6 accordingly. The grid sampling is roughly on 100-foot spacings and includes both 5-foot and 10-foot soil borings as appropriate, based on discussions at our 30 August 2000 review meeting.

The attached tables and figures present the sampling and analysis recommendations for Buildings 2 and 66 on BRC's C-6 facility.

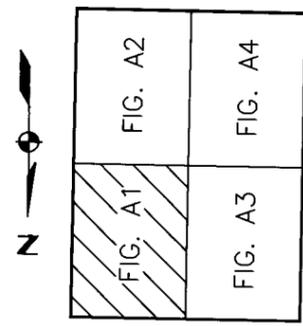
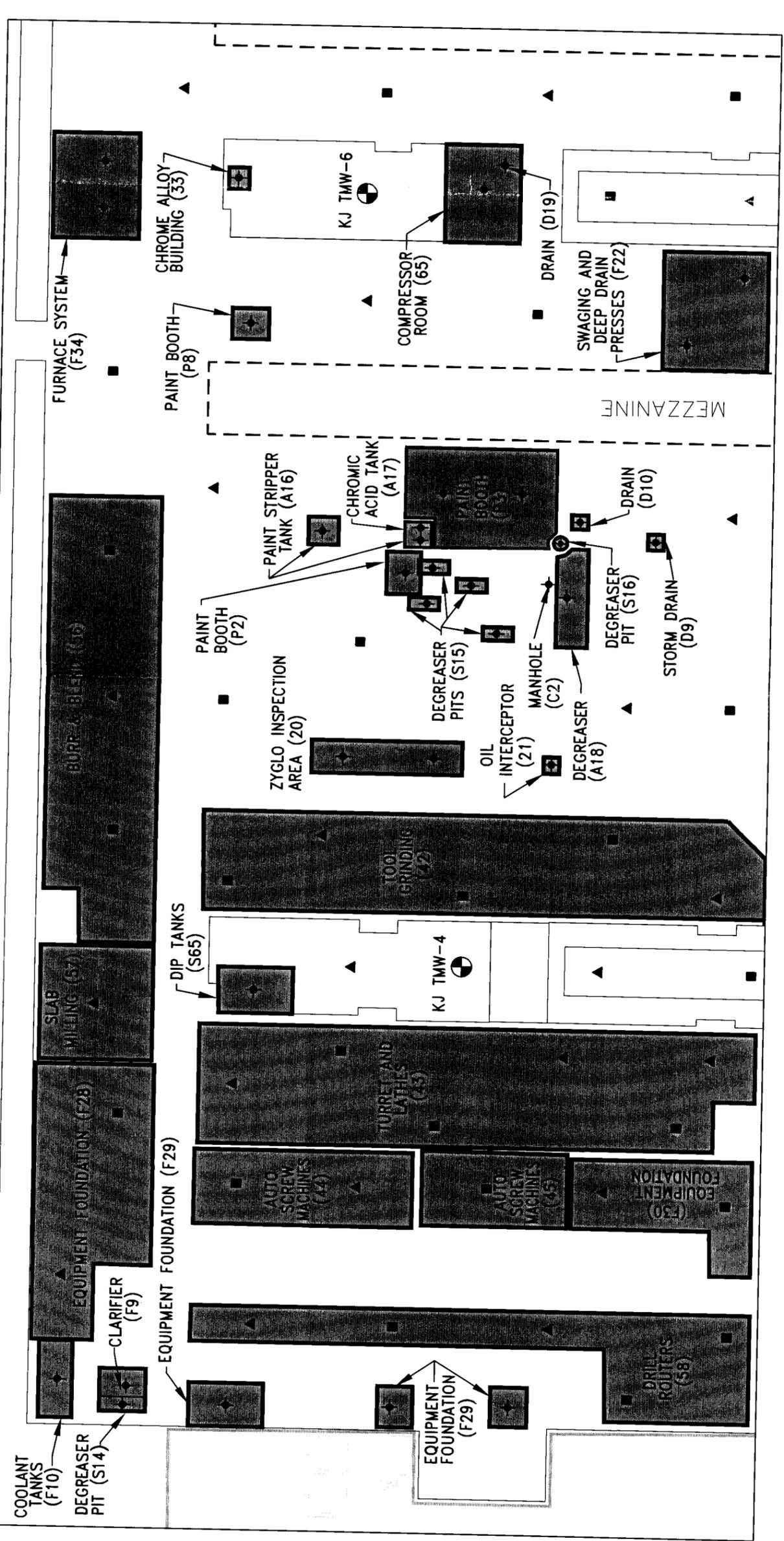
Tables

TABLE A5
SAMPLING AND ANALYTICAL PROGRAM FOR BUILDING 66
Boeing C-6 Facility Parcel C
Los Angeles, California
K/J 004026.00

Feature No. on Figure A5	Description of Feature	Operational Usage	COPCs Associated with the Feature	Proposed Number of Borings	Proposed Total Boring Footage	Sample Depths (ft)											Proposed Analytical Program					Comments			
						1	2	5	10	15	20	30	40	VOCs	Metals	Cr+6	TPH	PCBS	Cyanide	pH					
F35	Equipment foundation and oil ground surface	Metal processing	TPH, VOCs	1	10	x	x	x										x	x						10-foot sample- VOCs only
(F35)				1	5	x	x											x	x						
F36	Equipment foundation and oil ground surface	Metal processing	TPH, VOCs	1	10	x	x	x										x	x	x					10-foot sample- VOCs only
(F36)				1	5	x	x											x	x						
▲	Open Space			8	5	x	x											x	x						
■	Open Space			7	10	x	x	x										x	x	x					10-foot sample- VOCs only
				17	125						42						42	34	0	34	0	0	0	0	

Table Notes:
VOC analysis will include Methyl Tertiary Butyl Ether (MTBE).
Refer to Figure A5 for proposed soil boring locations.

Figures

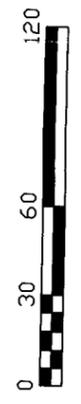


- EXPLANATION**
- KJ TMW-6 TEMPORARY GROUNDWATER MONITORING WELL
 - PROPOSED SOIL BORING AT SPECIFIC AREA OF CONCERN
 - 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
 - 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
 - 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
 - 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
 - AREA OR FEATURE OF CONCERN

NOTE: REFER TO TABLE A1 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.

DEGREASER (S15) NUMBER IN () REFERS TO FEATURE NO. ON TABLE A1.



Approximate Scale in Feet

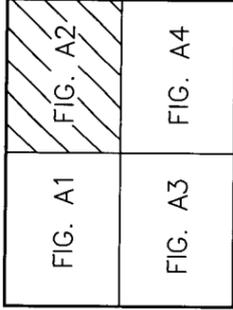
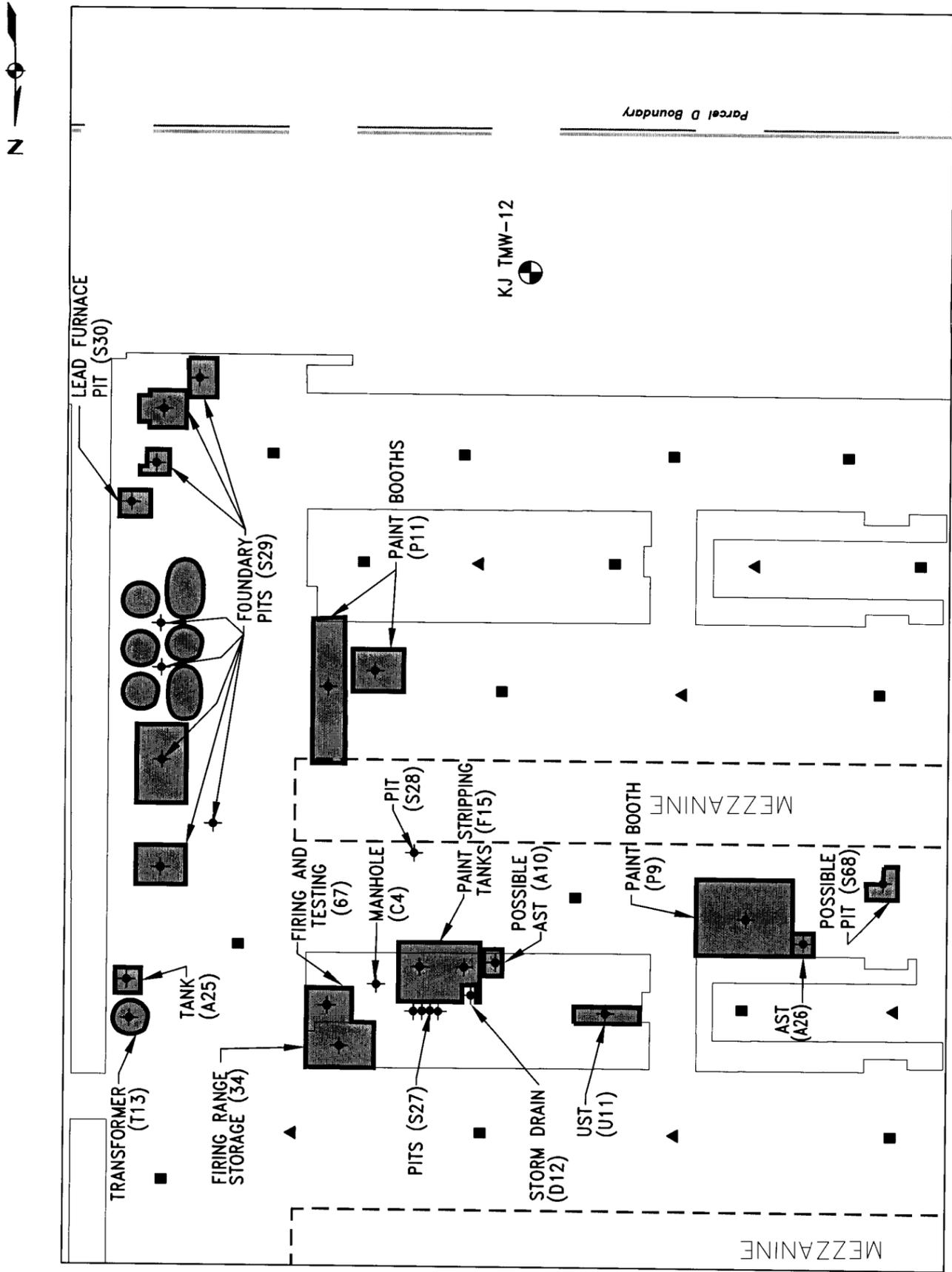
Kennedy/Jenks Consultants

Boeing Realty Corporation
C-6 Facility

Parcel C, Building 2 -- NE Quadrant
Areas of Concern and
Proposed Soil Boring Locations

September 2000
K/J 004026.00

Figure A1



BUILDING 2
KEY PLAN

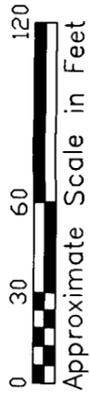
EXPLANATION

- KJ TMW-12 ● TEMPORARY GROUNDWATER MONITORING WELL
- ◆ PROPOSED SOIL BORING AT SPECIFIC AREA OF CONCERN
- ▲ 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- ▣ 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- ▤ 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- ▥ AREA OR FEATURE OF CONCERN

NOTE: REFER TO TABLE A2 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.

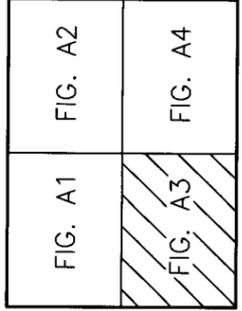
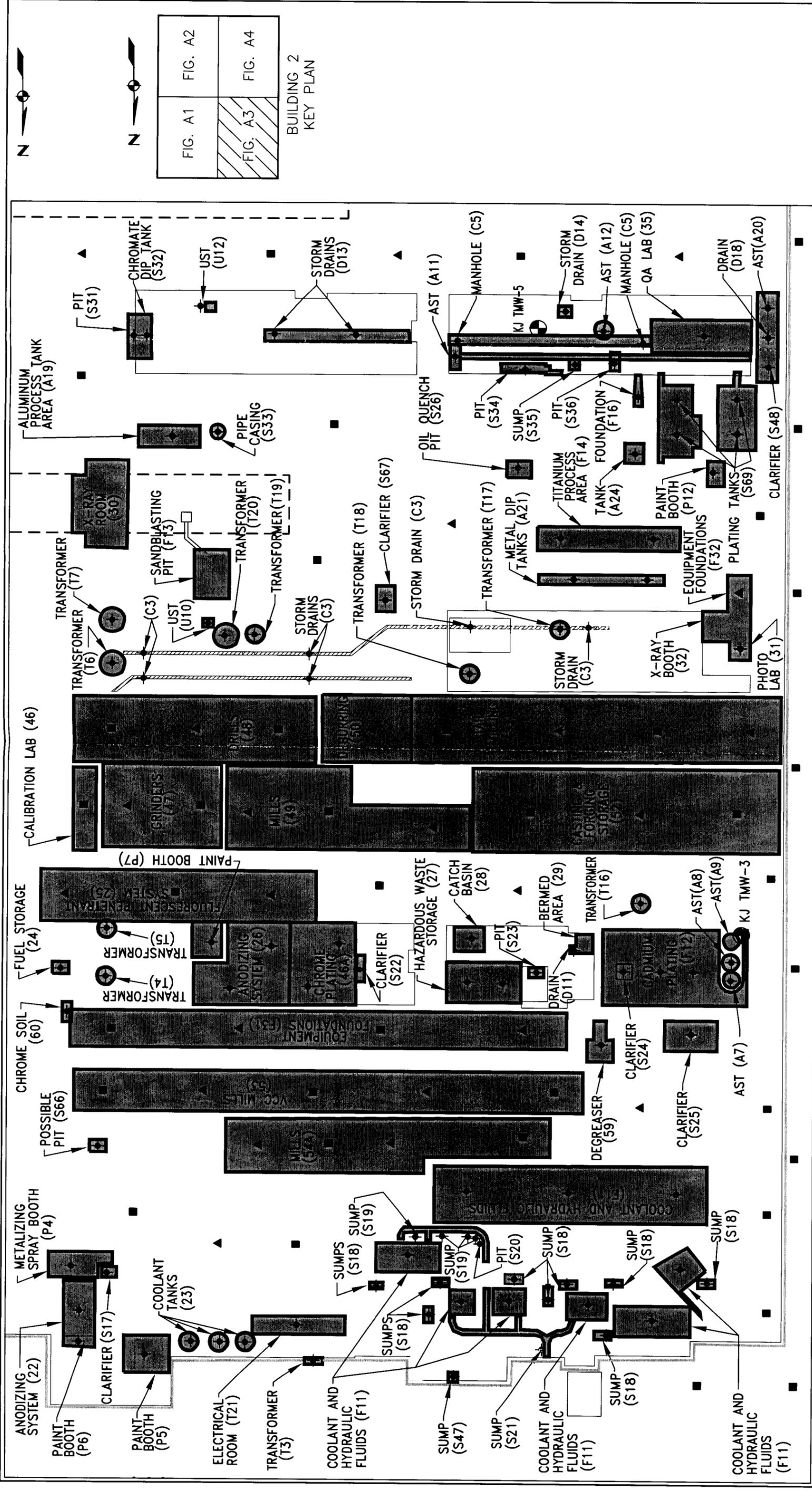
PAINT BOOTH (P9) NUMBER IN () REFERS TO FEATURE NO. ON TABLE A2.



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C-6 Facility

Parcel C, Building 2 - SE Quadrant
Areas of Concern and
Proposed Soil Boring Locations

September 2000
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Figure A2



BUILDING 2
KEY PLAN

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Boeing Realty Corporation
C-6 Facility

Parcel C, Building 2 - NW Quadrant
Areas of Concern and
Proposed Soil Boring Locations

September 2000
K/J 004026.00
Figure A3



Approximate Scale in Feet

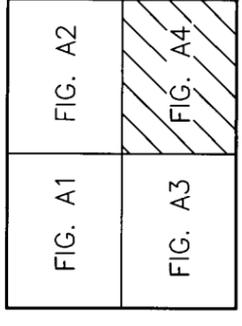
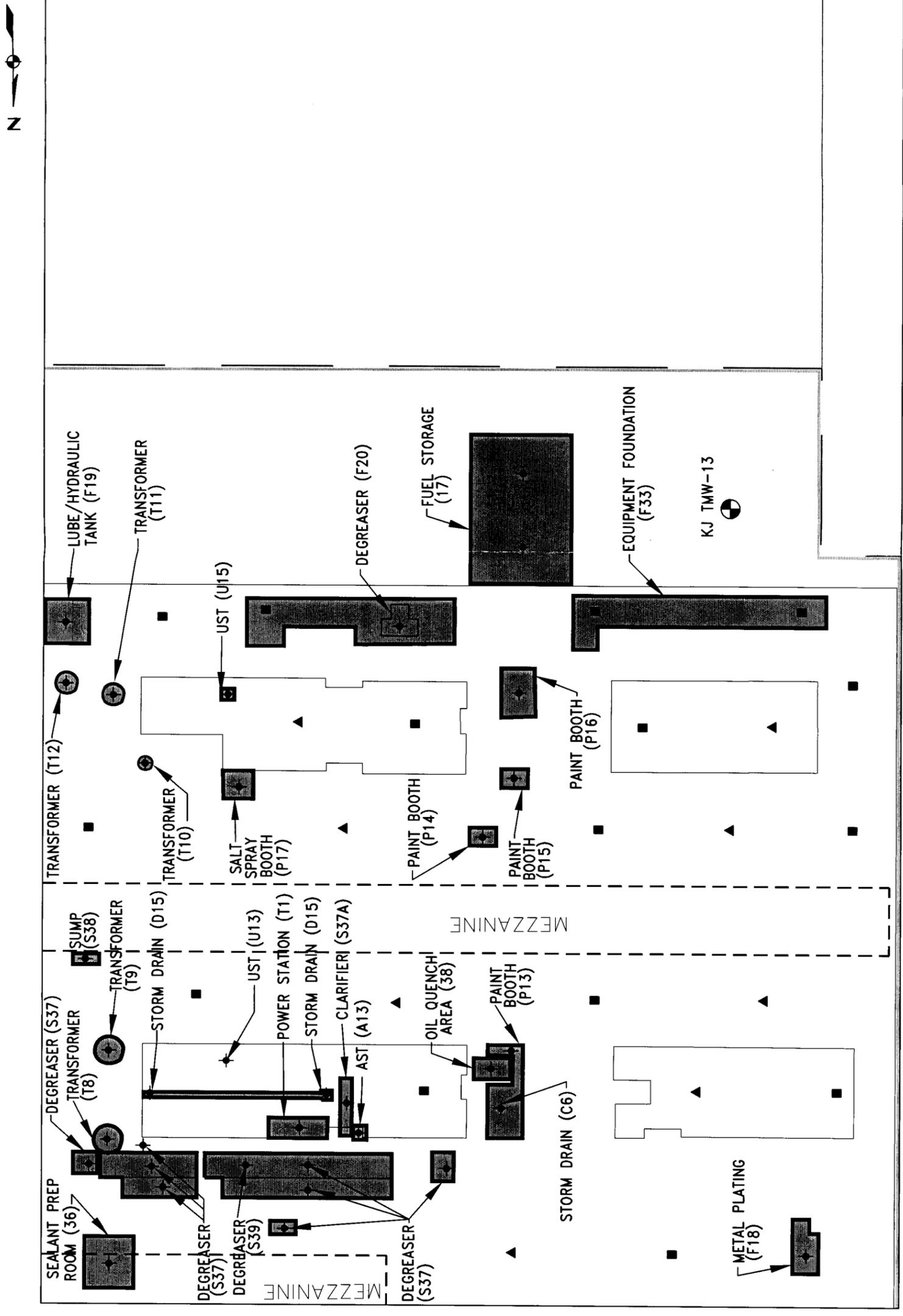
- ▲ 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- AREA OR FEATURE OF CONCERN

EXPLANATION

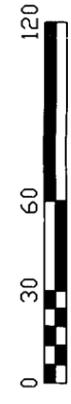
- KJ TMW-3 TEMPORARY GROUNDWATER MONITORING WELL
- ⊕ PROPOSED SOIL BORING AT SPECIFIC AREA OF CONCERN
- ▲ 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- NUMBER IN () REFERS TO FEATURE NO. ON TABLE A3.

NOTE: REFER TO TABLE A3 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.



BUILDING 2
KEY PLAN



Approximate Scale in Feet

- 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- AREA OR FEATURE OF CONCERN

EXPLANATION

- KJ TMW-13
- TEMPORARY GROUNDWATER MONITORING WELL
- PROPOSED SOIL BORING AT SPECIFIC AREA OF CONCERN
- 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- PAINT BOOTH (P13)
- NUMBER IN () REFERS TO FEATURE NO. ON TABLE A4.

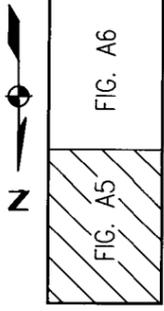
NOTE: REFER TO TABLE A4 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.

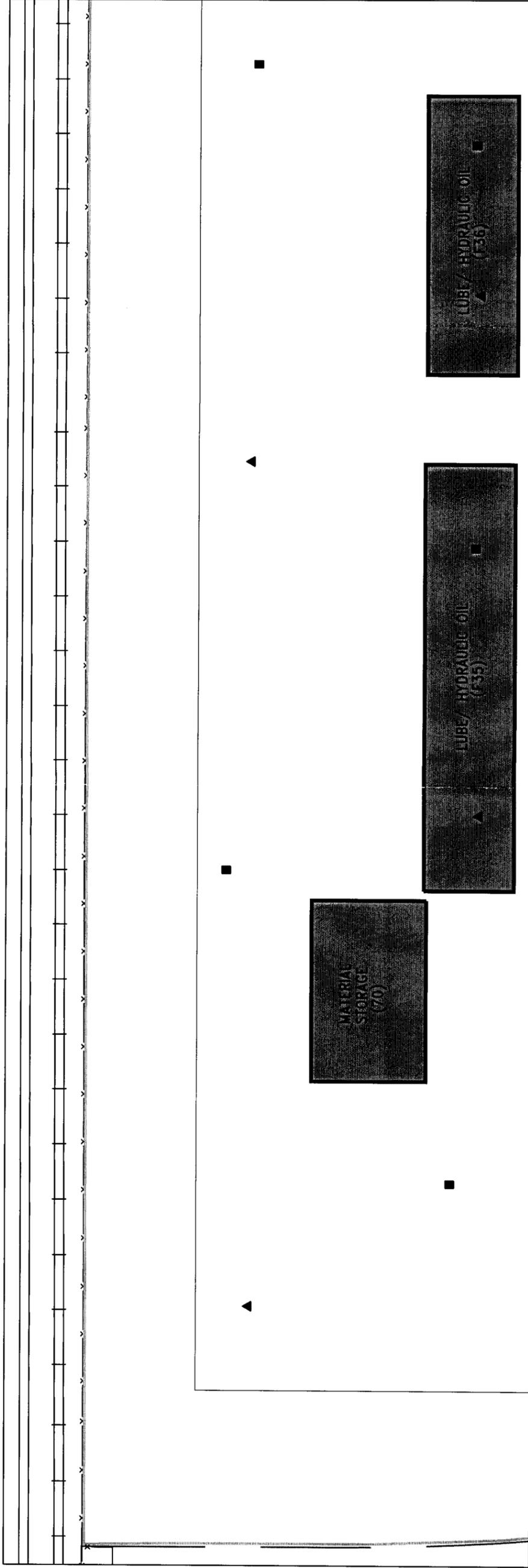
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Boeing Realty Corporation
C-6 Facility

Parcel C, Building 2 - SW Quadrant
Areas of Concern and
Proposed Soil Boring Locations

September 2000
K/J 004026.00
Figure A4



BUILDING 66
KEY PLAN



EXPLANATION

- ▲ 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- ▲ 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- AREA OR FEATURE OF CONCERN

MATERIAL STORAGE (70) NUMBER IN () REFERS TO FEATURE NO. ON TABLE A5.

NOTE: REFER TO TABLE A5 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.



Approximate Scale in Feet

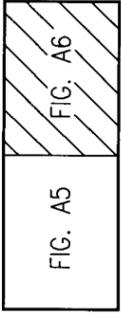
Kennedy/Jenks Consultants

Boeing Realty Corporation
C-6 Facility

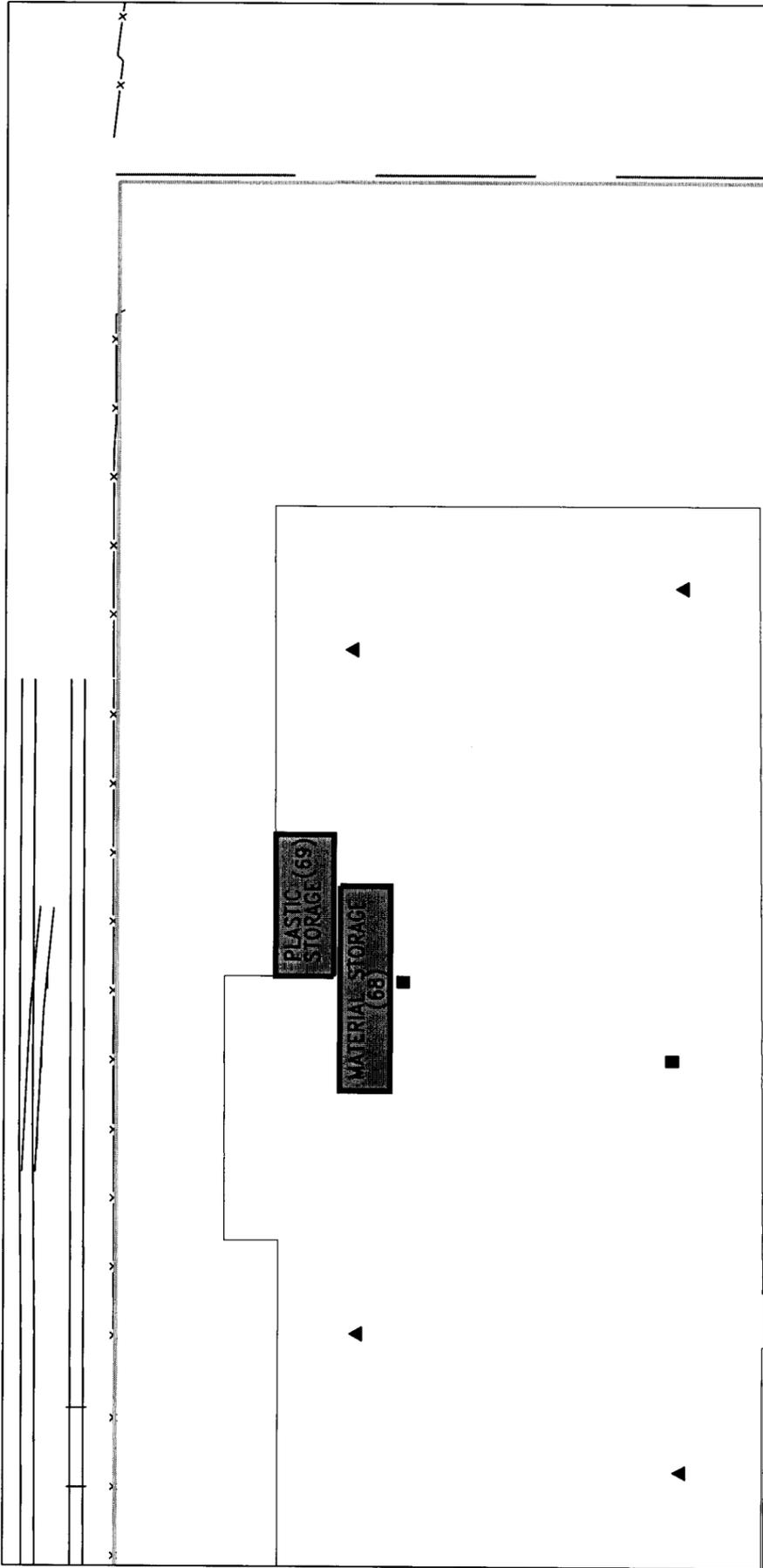
Parcel C, Building 66 – Northside
Areas of Concern and
Proposed Soil Boring Locations

September 2000
K/J 004026.00

Figure A5



BUILDING 66
KEY PLAN



EXPLANATION

- ▲ 5' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- 10' DEEP SOIL BORING IN OPEN SPACE TO SUPPORT RISK ASSESSMENT
- ▲ 5' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- ▲ 10' DEEP SOIL BORING IN MULTIPLE PROCESS AREAS OF CONCERN
- ▲ AREA OR FEATURE OF CONCERN

MATERIAL STORAGE (68) NUMBER IN () REFERS TO FEATURE NO. ON TABLE A5.

NOTE: REFER TO TABLE A5 FOR DETAILED EXPLANATION OF AREAS OF CONCERN AND PROPOSED ANALYTICAL PROGRAM.

Modified from IESI, 2000.



Approximate Scale in Feet

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Boeing Realty Corporation
C-6 Facility

Parcel C, Building 66 - Southside
Areas of Concern and
Proposed Soil Boring Locations

September 2000
K/J 004026.00
Figure A6